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MR. GIFFORD'S ADDRESS IS A STRONG ARGUMENT FOR COOPERATION

Coming from the head of the largest telephone organization in the world, the address of Walter S. Gifford, president of the American Telephone & Telegraph Co., on the business situation attracted a great deal of attention and has inspired much discussion. There has, in fact, been more discussion of Mr. Gifford's views than has followed any of the many disquisitions, surveys, forecasts and statements that have come from various industrial leaders—and there have been plenty and to spare.

Most of the comments have been most favorable, which is doubtless gratifying to Mr. Gifford and the telephone fraternity who took a keen interest in his opinions, not only because he was optimistic as to the outlook but because he analyzed the situation from the standpoint of a telephone man.

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His address, by the way, was a strong argument for cooperation in business affairs. It has become the fashion in times of emergency to urge the selection of a strong leader who is to take command and conduct the people to safety. Maybe this idea goes back as far as the flight from Egypt when Moses was raised up to deliver his race from bondage. Even to this day we are apt to ask for "a Moses to lead us out of the wilderness."

Mr. Gifford takes the stand, however, that it will, instead, be the cooperative effort of all the people that will lead to recovery. His rejection of the idea that a business autocracy can successfully control American industry will be of real interest to telephone men. It is worth noting, too, that this opinion is the one most generally commended in the press reviews of his address.

* * * *

What he said on this subject deserves permanent recording and frequent reading, for it agrees with what many of the telephone fraternity have been preaching for years.

"In this depression," said Mr. Gifford, "some folk of intelligence but little faith have been calling for immediate remedies, for strong leaders to make everything all right at once for everybody, and, if not for these, for some one to sacrifice on the altar of their discontent. As a matter of fact, there are plenty of men in the United States who have the capacity to become the 'strong leaders' of history. But to be such they must have power, autocratic or tyrannical power.

"Uneducated peoples that cannot attend to their own affairs must have such leaders. Educated peoples do not need them and will not tolerate them. *Forty years ago there may have been an idea that our people would like such leaders in industry, but the course of events since then has made it as clear as a summer sky that the atmosphere of the United States is as bad for the autocrat in industry as for the autocrat in politics.*

In my opinion there is no use looking for any Napoleons to lead us on to economic Austerlitz—or to Waterloo. We are going to go forward out of this valley, as we have from others before—by the democratic road—by the thought and efforts of thousands of intelligent, able people—by the wisdom of the many."

This constitutes a forceful argument for cooperation in business affairs, and it should be remembered by the interests identified with the two groups in the telephone industry.

On the Independent telephone side, at least, there was a strong conviction from the very start that the atmosphere of the United States is not healthy for the autocrat in industry. The growth of this idea has led to better cooperation between the two groups in recent years, and it is one of the important factors that has given the telephone business its present enviable position in public esteem. That is why it stands so distinctively high among the other utilities.

This policy of cooperative agreement between the two telephone groups should be continued in the future—in times of depression and in times of prosperity—for the general welfare of the industry. The political developments of the next year or two are likely to make this necessity more apparent than ever before.

* * * *

In view of the importance of the telephone as a business barometer, what Mr. Gifford said about business recovery has been received with close attention.

"The immediate present, the statisticians of the telephone company tell me," he remarked, "shows signs of improvement. How fast that improvement will be, measured in weeks or months, I don't know. But in the telephone company we have every confidence in the future—not only confidence but the keenest interest in the possibilities ahead of us."

It is significant that many of the press comments on the address point out that, as the head of a great communication system, Mr. Gifford is unusually well-informed as to conditions, and that his hopeful view of the situation is, therefore, all the more encouraging.

Rural School Service.

The whole country felt a glow of interest in reading that President and Mrs. Hoover had entertained at the White House 13-year-old-Bryan Untiedt, the heo of the Colorado school bus tragedy last March. The king and queen of Siam were guests of the nation at the same time, but the lad who saved the lives of 16 of his schoolmates in the blizzard in which the driver and 5 of the 21 children perished, was given about as much notice as the Oriental royal visitors.

Newspapers throughout the Western states are calling attention to the fact that this Colorado country school—and practically all rural schools—had no telephone, and a drive is on in many districts to compel the authorities to provide service. Many rural schoolhouses are located off the main roads, and are more or less isolated, and the Colorado tragedy has aroused public sentiment to demand that they be connected to telephone lines as soon as possible.

The Nebraska Telephone Association is sending out a pamphlet to all companies urging them to cooperate with school boards and see that telephones are installed in all rural schools. Charles W. Taylor, state superintendent of public instruction, has joined in the work, and in a letter to all county heads of schools says: "Tragedies of the recent blizzards should serve to convince school boards as to the necessity of installing telephones in the school buildings."

The Daily News of Hays, Kans., investigated and found that not one rural school in the Hays district had a telephone, and it is making a vigorous fight to have service provided for every such school.

"It is almost unbelievable that such obvious necessary protection to the lives of little ones has been overlooked," says a News editorial, "yet that appears to be the state of affairs according to the management of the telephone company.

"Blizzards are not the only risk. Tornadoes are a threat in the spring of the year. Fire risk is always present, and many other unlooked for dangerous things can happen when an alarm should be given. It is a fine thing to have a great faith in Providence, but the fathers and mothers of boys and girls attending rural schools should insist that every schoolhouse have a telephone connection."

* * * *

Secretary Kloidy of the Nebraska Telephone Association is sending extracts from press articles demanding telephone service for the schools to all companies operating in Nebraska, and it is expected the situation will be taken care of before winter comes again. There is talk of passing a state law covering the matter. These developments will help the efforts of the telephone companies which have long urged the placing of telephones in the schools.

COMING CONVENTIONS

Arkansas Telephone Association, Arlington Hotel, Hot Springs, May 14, 15 and 16.

Up-State Telephone Association of New York, Seneca Hotel, Rochester, May 20 and 21.

Pennsylvania State Telephone & Traffic Association, Hotel Penn Harris, Harrisburg, May 26, 27 and 28.

Kansas Telephone Association, The Sunflower Hotel, Abilene, June 2, 3 and 4.

Some Thoughts on the Industry's Future

Public Wants Its Telephone Service of the Best; Will Not Be and Should Not Be Satisfied With Anything Less—Effect of Economic Readjustment on the Industry—Address at Convention of Ohio Independent Telephone Association

By Randolph Eide,
President, The Ohio Bell Telephone Co.

It is a real source of pleasure to me to come to your annual convention, and I trust my remarks on so uncertain a matter as the future will not be taken in the light of prophecy for the simple reason that I shall do little, if any, forecasting. It is my hope to have whatever I say, which will be somewhat discursive, serve to stimulate sound and helpful thinking about our industry and its problems.

During the past year and a half all industry has been jolted rather hard by a world-wide economic readjustment or, as it is more commonly termed, a business depression. About us we see the results of industry's slackened pace in the form of unemployment, apple sales, charity drives, special relief legislation, distress and suffering, wage reductions, reduced or no profits, cutting of dividends or their omission altogether, bank failures, falling prices of commodities, and a thousand and one other disturbing and serious consequences.

Ever since the world began there have been good times and bad times. Before communication and transportation, fluctuations were local in character. A revolution in Mexico had little or nothing in it of concern to us here in Ohio. Civil war in China, or the abdication of a king in Europe, did not upset seriously the economic machine in the United States.

Our markets more and more have reached out until they have become world wide in character. Transportation and communication have linked the world closer together, with the result that this thing we call "business" not only has grown into a big affair but also into an extremely sensitive thing.

The severity and apparent suddenness with which the present process of readjustment came upon the business world dazed a lot of sound business men, befuddled others, and unnerved and made incurable pessimists of still others. The readjustment was in sight in the summer of 1929, but its real effect was not seriously considered until the stock market crash in November of that year.

Every day there are offered new types of cures. Some think business can be revived by legislation, others by cutting wages, others by stimulating public work, and so on and so on. In common with other depressions the present situation has its quota of people who feel and say that "this time" we will never get out of the woods, recovery will never come.

On the whole it appears to me that the

process of readjustment can at best be worked out only slowly. I am not going to attempt to tell you when the elusive normal will be with us again.

As a result of the severity of the present situation there has been started a new type of planning and business thought among business men, that I am confident will achieve a more stable control of business when it is on the up-grade, and will act as a brake and lessen and soften the effects when any readjustment again comes. Production and consumption should and probably will be kept in better balance.

The telephone industry rightfully can point with pride to the results obtained during 1930. Certainly, great progress was made toward still better service; and, while the financial results were not satisfactory, on the whole they were less adversely affected than was the case in a large number of lines of endeavor.

This result is something, however, for us telephone men to consider. It gives rise to a question regarding our rates and earnings that may be misunderstood. Many people look with envy toward the telephone industry, because our financial results during a period of depression may give the impression that our business is immune from the adverse results of these economic readjustments.

This is not only the feeling as regards the telephone industry but it is true in most respects as to all utilities. Excepting the peculiar problems of street and interurban railroads and the rather sharp falling off of railroad earnings in 1930, there is good reason for this impression, as gross revenues in most utilities held up well during the year 1930, and net earnings compared with industry in general were, in this year of severe business depression, substantially in favor of utilities.

This result, on the other hand, is one that, I am sure, we shall not be required to apologize for to the public. The public wants its telephone service of the best, and will not be and should not be satisfied with anything less. To have the industry so soundly managed and financed that relatively the industry can resist successfully these business cycles, is an assurance to the public of continued good service.

Those of us in the telephone business during the past two years, nevertheless, can testify to the effect of this economic readjustment on the industry. In years when profits of general business are large there is never a similar increase in profits in the telephone business. In fact, unusual activity in general business often makes necessary large and costly expansion in the telephone business that may result in reduced rather than increased earnings.

The telephone industry is operated on a small margin of profit—earnings seldom reaching 7 per cent on the actual investment, which is usually less than fair value—with the result that any condition of economic adversity falls heavily on telephone companies, which is the more serious because they are not in position under regulation to make compensating profit in prosperous times.

Large and small cities alike have had little or no gain in number of telephones, and so far this year losses appear to be quite the general experience. Long distance calling and revenue also have fallen off. In spite of the rather favorable results by comparison with other business in

"To Have the Telephone Industry So Soundly Managed and Financed That, Relatively, It Can Successfully Resist These Business Cycles Is An Assurance to the Public of Continued Good Service," Declares Mr. Eide. "To Continue Successfully, the Telephone Industry in the Future Must Proceed Along Conservative and Sound Lines with Respect to Its Service and Profits."

1930, the most careful management appears necessary in the future to maintain a satisfactory result and rate increases would seem to be a procedure only of last resort.

The investment per telephone has been increasing over a period of years, due to the necessity of meeting the public's requirements for enlarged, better and more dependable service—service that is free from interruptions and imperfections.

There is no utility or public service upon which the public is more dependent than on the telephone. There is no utility whose quality of service is of greater importance, as the telephone is in reality the nervous system of social and economic organization—and there is no satisfactory substitute for it. There is no utility or public service in any way analogous to the telephone.

Electric light, gas and water are each furnished from a common source of supply, through common mains, or over common transmission and distribution lines, and service is obtained by turning a key or a faucet. Transportation, either of persons or goods, is conveyance in a vehicle or vehicles in common with other goods or persons, running on a predetermined schedule between definite points, and a large volume of business may be carried on simultaneously over the same line or route.

The commodity sold in the telephone industry is a personal service and a type of service which makes it necessary to relate every telephone added in any community to each and every other telephone already there, bringing about the unusual situation of a greater cost of service consequent upon a greater development; a greater cost as the number of customers to be reached increases with a city's expansion and growth.

In most manufacturing businesses, in the electric light and power industries, in the railroad and transportation fields, the opposite is true as there is a tendency toward a reduced cost of service accompanying increased volume.

Telephone service consists in making available a telephone circuit for personal conversation of parties personally present at distinctly separate terminals, either in the same city, or in different cities. Each circuit is used exclusively by the parties talking, and the time it is used is determined by the convenience of the parties.

The investment per telephone is bound to increase with growth and further public requirements. As a matter of fact, little or no increases have been made in rates during the past six or seven years, but the scope and extent of the service to the customer have been enlarged, which is equivalent to a substantial reduction in rates, or certainly to an increased value of the service to the user at no advance in price. This has been made possible only through the efficiency, research and the resourcefulness of management.

To continue successfully, the telephone industry in the future must proceed along conservative and sound lines with respect to its service and profits. The service at all times must be the best, and the cost must be kept at the lowest possible amount with only a reasonable and small margin of profit. At the same time, however, rates and charges must always be sufficient to insure the financial integrity of the industry, because rates less than these are bound in the long run to result in service something less than the best.

Even though our industry is rather unusual or unique in that it is dissimilar to most others with respect to the relation between volume and cost, comparisons are drawn; and to those unfamiliar with the telephone business, misunderstanding is likely to result. We in the industry have ahead of us the important task of making it clear to the public that our industry is to be differentiated from others in this respect.

The telephone industry is rightfully developed along non-competitive lines. Long ago it was demonstrated that service by two companies in any community was wasteful, more costly, incomplete, and gen-

erally unsatisfactory, both to the company and the investor in the business and ever to a greater extent to the user of the service.

Public demand made it necessary for telephone companies to work out arrangements whereby dual service was eliminated and thereby furnish a complete and comprehensive unified service, relieving the public of the burden, inconvenience and excessive cost of two systems, and bringing to the public the benefits of one telephone system for a community which could be interconnected to all of the telephones in that and in every other community.

This, with only a few exceptions, has been completely made a reality in the comprehensive system of telephone communication now established in this country, with either the Bell System or a local company operating in a community, with interconnecting arrangements over the toll systems so that any telephone now can be easily interconnected with any other telephone, not only in this country but to a large percentage of the world's telephones.

It is generally supposed that competition is responsible for lower costs and prices than would prevail without it. If business did not have, some people argue, the incentive which competition provides, in either making the product better or the cost to the consumer less, or both, there would be no end to the profit that would be exacted.

Safeguards in the form of legal limitations or monopoly, price fixing, trade association agreements, etc., are common, all of which are intended to guard against unwarranted profits and to permit competition to work, without interference, to give to the consumer the most and best for his money.

But in the midst of this is the telephone industry which by its very nature is non-competitive in every community in Ohio, a natural monopoly, with no other place for the customer to go for a similar service. Whatever has developed of a monopolistic aspect with respect to the industry is inherent in the telephone service itself, and has been created by public demand, educated to the advantages of universal service without duplication.

It is, however, only quite natural that many may feel that without competition and enjoying all the opportunities of monopoly for excessive profits, there can be nothing other than extraordinary profits flowing into the industry's treasury in times of good business, and good profits as well even in times of depression.

It is true that rates for service are subject to the scrutiny and approval of public regulatory bodies; and while these regulatory bodies themselves are created for the purpose of fixing reasonable rates, both to the customer and the company, the non-competitive aspects of our industry, with misleading, mistaken or meager information regarding the industry's policies, result in misunderstanding and many times in wrong and totally unwarranted conclusions.

If we can fully establish the industry in the confidence of the public; if we can make it clear that we honestly desire to give the best possible service at the lowest possible cost, consistent with financial safety—then, I am sure, many of the difficulties that may have existed in the past will disappear and we will be freer to devote ourselves to the congenial task of making our service more and more satisfactory to our patrons.

If we are successful in achieving these aims, I feel confident that ambitious men will in the long run find it difficult to advance their personal fortunes through unjust and undeserved attacks on our industry.

No business can be conducted permanently without some margin over and above operating expenses, which in the telephone industry must include ample maintenance of plant at the highest possible standard, satisfactory, a poorly-maintained plant, and ducing service, and adequate provisions for capital depreciation, after which there must be a reasonable return on the fair value of the property devoted to the public service.

The temporary benefit which accrues to the consumer from unprofitable prices will in the end result in a service that is unsatisfactory, poorly-maintained plant, and perhaps loss of capital that has produced and must continue to produce service.

I have thought at times that we are somewhat "price shy." Certainly telephone service of high standard is worth much more to the user than he pays; and so long as we keep that situation, difficulties with respect to charges should prove only temporary. I am sure that on the whole the public appreciates the improvement in service over the past years, but on the other hand I am equally sure that in the background is a feeling that somewhere there are unusual profits in our industry.

We know that there are none where sound business principles prevail and that large profits can continue to have no place in the industry. I believe we can dispel by our own efforts any ideas that there are some things in the general charges for telephone service that yield more than is necessary to the financial safety of the business, a reasonable payment to shareholders and the assurance of the best service.

Speculative prices paid or offered for telephone properties or telephone stock in the past in Ohio have caused some concern to our industry. Those of us in the industry, accepting the only sound policies under which the industry can successfully operate, can and must dispel any doubts.

Before closing, I want also to say a word about taxes. The cost of government has been increasing rapidly and with it the taxes on the telephone industry and other utilities are mounting. About ten cents out of every dollar of gross telephone revenue in Ohio go to the payment of taxes, which in turn pay the cost of government. The telephone industry justly should pay its fair share of taxes, and I believe on the whole the industry has made no attempt to escape this responsibility.

Utilities as a whole, however, have been more and more employed as tax collecting agencies. I believe the non-competitive

America Will Emerge from Valley by Democratic Road.

"American democracy is founded on the participation of all the people in government, in the benefits of education, and in the well-being made possible by ample production.

Truly, none of these works perfectly. Some people do not vote, some resist education and some have, through no fault of their own, failed for the time being to find employment and well-being. But as imperfect as is our use of our democracy its essentials constitute the foundations on which the progress of the future will be built, and the very independence that comes from political liberty and the intelligence that comes from widespread education is complete assurance of continued improvement.

In this depression, some folk of intelligence but little faith have been calling for immediate remedies, for strong leaders to make everything all right at once for everybody, and if not for these, for someone to sacrifice on the altar of their discontent.

As a matter of fact, there are plenty of men in the United States who have the capacity to become the 'strong leaders' of history. But to be such they must have power, autocratic or tyrannical power. Uneducated people that cannot attend to their own affairs must have such leaders. Educated people do not need them and will not tolerate them.

In my opinion, there is no use looking for any Napoleons to lead us on to economic Austerlitz—or to Waterloo. We are going forward out of this valley as we have from others before—by the democratic road—by the thought and efforts of thousands of intelligent, able people—by the wisdom of the many.

I know that to the impatient, to those who want an over-night remedy, this is a discouraging prospect, for the democratic method does not work overnight, nor do the remedies it provides come in democratic fashion wrapped and labeled for all to see and admire. A dictator produces better headlines than a democracy but in the rest of the story, the advantage is the other way."—Address by W. S. Gifford, president, American Telephone & Telegraph Co., at annual meeting of Associated Press.

POOR LYDIA MURRAY

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

Poor Lydia Murray has plenty to live on—in her way. Many years ago, when she was just getting on in years, a relative died leaving her a tidy little fortune. This relative, with whom she lived, never seemed to get much out of life except a living, and worry about her money. Living in such a constant atmosphere of depression may have been the cause for Lydia Murray's queerness and closeness in money matters. She surely was an odd character.

So many small towns have at least one resident who is a person of odd character in one way or another. The residents do not pay much attention to such persons, but they have to be explained to newcomers, after which they are dropped out of the picture. "Oh, that's old Lydia Murray—she's queer. No, not crazy, but just queer in her ways and talk. No one pays any attention to her."

"'Lo, Lydia," folks say, as they pass her and, without waiting for her answer, they go right on talking to the person they are with. And Lydia, does she realize she is on the outside of everything that concerns the community?

She is never asked to do anything, such as serve on church committees, give anything, or go anywhere. "Lydia Murray," folks laugh. "No one would bother about her."

As I see her working in her neat little garden early and late these spring days, I ask myself: "Does she mind because she is not counted in on anything?" It has always seemed to me that anyone, who can make a garden grow as successfully as Lydia Murray does, must spend more than physical effort on it.

Somehow or other, I have never been able to treat poor old Lydia Murray as though she didn't count; especially when I see her sitting in church on Sunday mornings. How queerly she dresses. Now, I am using that word "queerly," too.

Instead of listening to the sermon, I find myself looking her way, wondering why she has come. Surely, it is not on account of pretty new clothes, the reason for some folks being present. I feel sure she has worn that odd-looking, faded green coat, brown dress, and dusty misshapen red velvet hat for several years.

Why is it that she is on the outside of everything in her community? I do not know, unless she has never gotten anything out of life except a living. She started wrong, living under the drab influence of her aunt. Perhaps she found it out too late to change, when she found herself on the outside of her community's life.

MORAL: Life holds other things in store for us in addition to a living. Let us enjoy them while we may.

"Shelter is gone when the night is o'er,
And bread lasts only a day;
But the touch of the hand and the sound of the voice
Sing on in the soul alway."

conditions under which they operate and the fact that on the whole during the past year of depression their earnings have suffered less than business in general, might lead to increased levying of taxes on our industry.

Years ago a state of public mind existed which threatened our banks. Later a similar state of mind nearly wrecked our railroads. It is short-sighted economy to make our industry more of a tax collector than it already is, and it is difficult for the public to relate the tax burden shouldered by the industry and the charges for telephone service.

I am confident that the telephone industry can look forward to a successful future. While the telephone industry is always confronted with many problems, none of them seems to me to be disheartening.

We may well entertain a feeling of optimism which should go naturally with the consciousness that we serve a young and vigorous industry; an industry which bids fair to continue to expand in usefulness and root itself more and more deeply in the appreciation of its patrons. As executives and managers of this industry we have an important public trust, and I am sure that we shall be able to administer that trust in a manner to continue meriting the confidence of the vast number of users of telephone service.

Children of the World to Converse on Goodwill Day.

With Washington and London as focal points, a novel telephone conversation between school children of the world will take place on May 18, world goodwill day. This will commemorate the first Hague conference, which opened May 18, 1899, under the auspices of the World Federation of Education Associations, in cooperation with the National Council for Prevention of War.

Augustus O. Thomas, president of the former organization, who announced the plans recently, said that negotiations were being carried on with the United States and British governments, so that the calls could be made from the White House and from 10 Downing street, the official residence of British Prime Ministers.

Beginning at 8 a. m. on the Pacific coast, Mr. Thomas said, schoolboys and girls will telephone from capital to capital of every state until the call reaches Washington. At the same time calls will be coming into Washington from the capital cities of South American and Central American countries and from the provincial capitals of Canada through Ottawa.

During the same day calls from all over Europe and from Africa and Australia are to center at London.

The program will reach its climax when, at 4 p. m., Washington time, which will be 9 p. m. London time, a student from London and one from Washington will converse and exchange word of the messages of goodwill which they have been asked to send from the young people of one-half of the world to those of the other half.

"The great problem of our times," Dr. Thomas stated, "is to realize the new kind of world, closely united and interdependent, capable of quick communication for the adjustment of any differences or misunderstanding in which we live. It is believed that to talk in this way around the world, to hear each other's voices across thousands of miles, will help young people in the schools to form a new picture of the world."

The student chosen in each state to receive the goodwill message from Washington which will be relayed to a neighboring state will speak either from the governor's mansion or from the state capitol.

Prices in the Metal Markets.

New York, May 4: Copper—Unsettled; electrolytic spot and future, 9@9½c. Iron—Quiet; No. 2 f. o. b. eastern Pennsylvania, $16.00@17.00; Buffalo, $15.00@16.00; Alabama, $11.00@13.00. Tin—Easy; spot and nearby $22.87; future, $23.12. Zinc—Steady; East St. Louis spot and future, 3.35c. Antimony—6.75c. Quicksilver—$102.

Economics of Relays Applied to Circuits

Because of Enormous Production of Relays Used in Telephone Circuits, Economic Factors Are of Prime Importance—Power Costs for Operation—Windings and Speed of Operations—Other Factors Entering Into Economic Operation

By W. W. Wells,
Technical Staff, Bell Telephone Laboratories

In the matter of the selection of relays for telephone circuits, the cost of the individual relay is not great, and its current consumption is so small that the saving to be obtained by close calculation for the most suitable design might seem to be almost negligible.

The number of relays used, on the other hand, is very large; the relay production of the Western Electric Co. in 1929 was upwards of 9,000,000. Because of this enormous production, economic factors are of prime importance, and possible savings—both in the initial and operating cost—reach considerable magnitude.

Due to the almost innumerable circuit conditions under which relays must operate, however, a practical point of view must be maintained. It is obviously impossible to design an ideal relay for each particular condition that may arise. Such a procedure would frequently require the design of a different relay for each application, and would ultimately result in the manufacture of an excessive number of types.

The development of new relay structures, therefore, is not frequently advisable. Because of this, the economic application of existing relay structures only will be considered here. The development of new windings and spring arrangements as required will be discussed but not the design of a new structure.

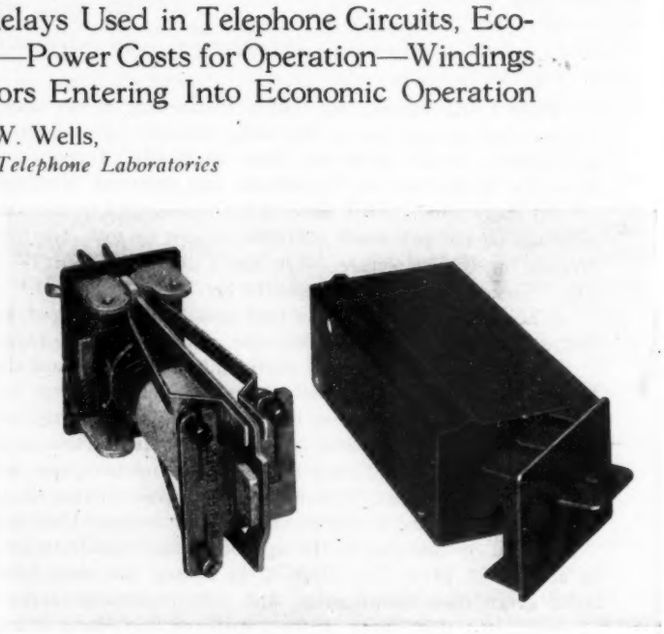


Fig. 2. A Light But Expensive Relay Is the "B" Type, Which Is Used Only When Great Sensitivity Is Required.

Many relays, as used in telephone circuits, are energized only a very short time and current consumption, therefore, is so small as to be actually a negligible factor. The resistance, therefore, may be as low as is consistent with keeping within safe temperature limits. Others are energized during an entire conversation and may be in continuous service for from 20 to 40 minutes or more during each busy hour of the day.

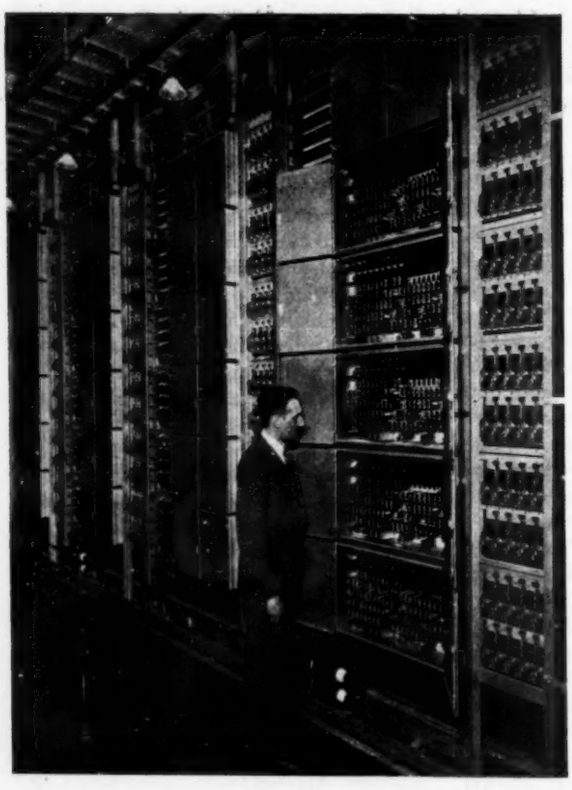


Fig. 1. The Large Number of Relays in a Dial Office Is Indicated by This Row of Sender Frames. Behind All of the Closed Doors Are Groups of Relays Like the Ones Being Inspected.

In some instances, relays are so connected in a circuit as to be in practically continuous operation 24 hours a day, being released occasionally for momentary intervals only.

As the number of relays in a 10,000-line office of the dial type amounts to more than 50,000 and a large proportion of them energized for considerable periods, it is evident that the total current drain is a very important factor. Unless care is exercised in the selection of favorable resistances for such relays, not only will the cost of the current consumed be excessive, but the size of batteries required may be appreciably increased, and a costlier plant required than would otherwise be necessary.

There would thus be added to the expense of maintaining the office not only the excess current consumption but also the additional cost of the larger battery-plant. In choosing relays for use in telephone circuits, therefore, efficient circuit design requires that proper attention be given to the traffic conditions, so as to determine the most suitable resistance from the standpoint of the current drain, as well as the capability of the relay to handle the load.

This increase in power cost, however, is not the only factor affecting relay economy. The cost of the winding of a relay varies with the size of wire and the number of turns used, and, in view of the large number of relays employed, may definitely affect the question of economic choice. If a relay is in circuit for only a few seconds per busy hour, it is quite probable that the cost of a high resistance winding to save current consumption would more than offset the current saving.

The necessity for keeping the relay from overheating under normal service conditions, or under trouble conditions in which the relay winding becomes accidentally connected across the battery, imposes some limitation on the design of windings.

Each path from battery to ground must, under service conditions, be sufficiently high in resistance to prevent the overheating of the magnet coils. Under trouble conditions, the magnet coil must either be high enough in resistance to prevent overheating or sufficently low to insure the blowing of the circuit fuse.

This means that for each type of relay there is a band of resistance values, ranging from a few ohms to several hundred which, if adopted, would cause the relay to become a hazard in the system. Such wind-

ings are, therefore, not usable although for other reasons they might be the most economical.

Another factor which enters into the choice of a relay is the pressure between contacts. The "B" relay for example has a low contact pressure due to its light construction, and it responds to currents of the order of a few tenths of a milliampere. It is not suitable where strong contact pressure is required such as for contacts forming part of the transmission circuit.

Because of the relative unstability of its contacts, therefore, the application of the relay is not considered for certain conditions regardless of its advantages even though otherwise its use could be justified on a basis of relay cost.

Another factor affecting economy in design is the speed at which a relay may be required to function. For many conditions it is necessary that a relay operate or release very slowly or very quickly, and the service gains to be obtained are of greater importance than relay cost and current consumption, so that a more expensive structure may be warranted.

One instance of this is the pulsing relay in dial systems which must respond quickly to the dial pulses. Here, again, the current consumption and relay cost are not factors to be primarily considered; the relay must be designed with resistance and inductance characteristics that will enable it to follow the dial pulses as faithfully as possible over a station loop of established characteristics. The gains to the system are in relative speed and sensitiveness.

Occasionally the use of permalloy as the magnetic material provides a more satisfactory release than is obtainable with magnetic iron. The relatively high cost of permalloy is offset, under these conditions, by improved current performance and a decrease in maintenance charges.

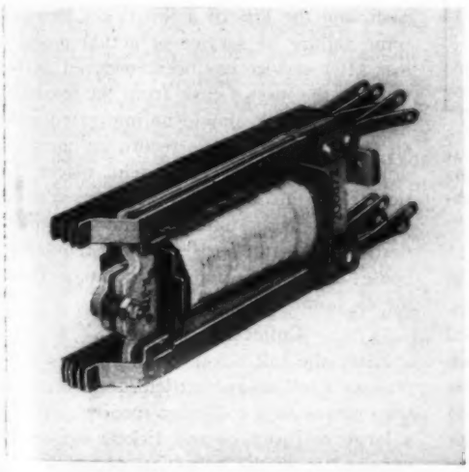


Fig. 3. One of the Less Expensive Relays Is the "R" Type. It Is Employed Widely in the Bell System Where Special Requirements Do Not Make Its Use Undesirable.

Some relays, such as the "B" type already mentioned, are much more sensitive than others; they require less operating current than the "R" type for instance, which is a heavy-duty relay, and may be used advantageously where only light spring pile-ups are required.

On the other hand, the "B" type relay is more costly than the "R," and this added cost can very easily offset the saving due to the smaller operating current. Because of the additional cost of the "B" relay it is never used except where the additional cost is compensated by the service gains due to its greater sensitivity.

An instance of this is the supervisory relay in manual cord circuits. The lower sensitivity of an "R" type would make inter-connection between subscribers impossible over any but the shortest lines. Here the question of economy is not one of current consumption, or wire and relay cost, but of service possibilities.

It is obvious that the longer the loop over which a relay will work, other things being equal, the greater is the gain to the system, since a wider area can be served or smaller gauge wire used.

Another feature of design to be kept in mind is the severity of the mechanical and electrical adjustments that must be applied to the relay. Close and severe adjustments increase both the cost of the relay in the factory and its maintenance in service. A point may easily be reached where these costs would be excessive for the service obtained.

For some special conditions, however, close adjustments may be warranted. This is true of the No. 231 type polarized relay, for instance, but it has only a comparatively limited application and the service given would generally be unobtainable by other means.

Relays inserted in the transmission line or bridged directly across it, give rise to transmission losses. Certain definite loss values have been established beyond which the relay should not in general be allowed to go, and the inductance characteristics of relays so used must also be considered.

Under certain conditions a crosstalk proof cover must be provided to avoid voice interference between adjacent circuits. The question of wire and current economics does not enter to any great extent into cases of this kind as service factors are controlling.

It must be borne in mind, however, that although it is always desirable to have the most capable relay to meet a given condition, it would not be economical to design a new winding for every condition. A new design is not developed, therefore, unless the probable demand is extensive enough to justify the cost of its development and introduction into the telephone system.

The question of coding a new relay of a standard type—with a coil, springs, or adjustments different from any existing relay—is an important item to be considered because of the expense in placing and maintaining such information in the shop and field. It is necessary, therefore, in the selection of a relay for a new circuit to compare the expense of a new code with the additional cost of using an existing relay which does not most economically fit the circuit from a design standpoint.

Fig. 4. An Early General Utility Relay That Still Finds Use in the Bell System Is the No. 122 Type.

If the annual charge, due to the use of a relay not most economically suitable to the circuit, is less than that due to the cost of a new code, it would, in general, be sounder policy to specify the existing relay. In fact, there should be a substantial yearly demand expected for the new relay before establishing a new code.

The history of relay development is, in a sense, that of development economics. The original general utility relay capable of carrying a considerable load was the No. 122 which gave very satisfactory service in the telephone field for a number of years.

As the telephone art developed, however, the need became imperative for a more economical relay; one more economical in first cost, in current consumption, in capability, in load possibilities, and in mounting space. The result of this need was the design and development of the A, E, and R types in the order named.

The manufacture of these relays is essentially a punch-press operation and they are, therefore, more cheaply produced than the No. 122 type, various parts of which are machine formed. Owing to their structure they are capable also of carrying more springs and thus permitting more circuit switching per relay. They also can be mounted on from ¾-inch to 1⅛-inch centers, depending on the number of springs and windings, which is more favorable than the 1¾ inches required for the No. 122 type.

It is evident from this brief review that the design and selection of relays for telephone circuits is playing an important part in the economic operation of the present up-to-date telephone system. Too much attention cannot be given them.

Commercial Importance of Toll Ticket

Correct Recording Efficiency of the Toll Ticket Is Directly Reflected in Service Rendered Toll User—How Long Distance Calls Are Entered on Toll Ticket—Paper Presented at Annual Traffic Session of Minnesota Association

By L. R. Welliver,

Auditor of Receipts, Tri-State Telephone & Telegraph Co., St. Paul, Minn.

The primary object of a telephone company is to render a good grade of telephone service to the public in order to pay its expenses and have a margin left over for the payment of proper and reasonable return to the investors in the business.

The toll operator performs a very important part in arriving at the objective. She not only has to satisfy the customer in giving him satisfactory service, but she must complete the ticket in a legible and understandable way, so that the charges can be collected and the expenses of the business paid, also the interest and dividends when due.

The rendering of good service not only involves the company's obligation to the public but also its obligation to the investors in the business. The operator's job has not been properly handled if any one of these obligations has been neglected.

It is the operator's responsibility to so prepare and complete the toll ticket that the accounting department can render a satisfactory bill to the customer to insure the prompt payment of the charges.

Functions of the Toll Ticket.

The functions of the toll ticket are many and varied. Toll service rendered to customers varies in quality, depending on the accuracy and efficiency of the operating forces. Their recording efficiency is directly reflected in the service rendered the toll user. An incorrectly recorded toll ticket will cause a great deal of difficulty in the proper and speedy completion of toll messages.

It is possible that you would be interested in knowing some of the things that happen to the toll tickets when received in the accounting office and of what the final disposition consists.

A visible index card record is maintained, showing each toll center and its tributaries, with spaces provided for each day of the month. As the tickets are received, a check is made under the proper date. This record is kept to insure the proper receipt of tickets and to guard against losses in mailing.

"In" collect tickets are checked in by invoice number as shown by the sending office. "Out" collect tickets are forwarded to distant accounting offices, accompanied by invoice tickets prepared in the accounting office. These invoice tickets are numbered in sequence, a separate series of numbers being used for each accounting office in the United States.

After being checked in, the owned exchange tickets and the connecting company and toll station tickets are entered in check ledgers maintained for joint settlement purposes. It is not necessary to enter all tickets in these check ledgers, as a considerable number constitute revenue in which no other company participates. Only the tickets involving joint traffic are entered in the check ledgers.

When the tickets covering joint traffic have been entered in the check ledgers, the owned exchange tickets are billed on toll service statements, and the connecting company tickets are totaled and the daily total entered on a recap sheet provided for each connecting company exchange. These tickets are then mailed to the connecting companies, who use them for billing their customers.

"If Our Relations With Connecting Toll Line Companies Are to Be Maintained at Their Best," Says Mr. Welliver, "the Little Matter of Showing the Correct Terminating Station on Toll Tickets Must Be Carefully Watched."

The owned exchange tickets, as soon as billing is completed, are forwarded to the local manager who uses them for collection purposes.

This is roughly what happens to the toll tickets after they leave the originating toll center.

Joint Toll Line Settlements.

The toll ticket serves a very important function in connection with studies covering inter-company business. The basic record of prorate studies is the toll ticket. Without the toll ticket, no fair and equitable prorate of the toll business could be obained that would be satisfactory to all parties concerned.

Air-line mileage measurements are taken from point of origination to point of transfer, and from this point to via transfer point or to point of termination when no via point is involved. These mileages so obtained are used to break up the gross revenue between the companies for which studies are made. These studies form the basis of settlements between companies which operate toll lines and whose lines are used jointly in the rendering of toll service.

The importance of properly prepared toll tickets in the preparation of these studies cannot be over-emphasized.

Billing Medium.

One of the major functions of the toll ticket is its use as a billing medium. Its use in connection with customer billing and for settlement purposes with connecting companies is of paramount importance. Without the toll ticket no customer or connecting company could be billed, and no revenue could be collected. Therefore, toll tickets rank in importance to actual cash, and the loss of a toll ticket, through some failure of service or actual physical loss after service has been rendered, is the same as the loss of cash from the treasury.

This, it seems, should be impressed upon all employes, from the recording operator, down to the filing clerk who places the tickets in the collection department's file where they stay until the time for their destruction as authorized by the regulatory bodies of the state and the Interstate Commerce Commission.

Collection Medium.

After the toll ticket has served its purpose as a billing and settlement medium, it then serves as a collection medium. While a large majority of toll tickets are never referred to in the collection department, a few have to be used for collection purposes.

Complaints regarding time consumed in conversation, claims covering reversal of charges, data in connection with uncollectibles, and a multitude of other things, must be procured from the toll tickets by the collection department.

Need for Toll Ticket Accuracy.

The need for toll ticket accuracy, we believe, is quite well understood by all oper-

ating employes. However, it might not go amiss to here emphasize this phase of the operator's job. In order to clarify this, we will cite an example to emphasize the importance of accuracy.

Suppose the recording operator inadvertently transposes the telephone number, which not infrequently happens. Let us try and visualize the results of this, assuming that there is no difficulty in completing the call, although there could be plenty of it in this connection. The wrong customer would be billed—as toll billing is done by telephone number—resulting in a complaint by the innocent customer for being billed in error, and making it necessary to issue a transfer in the collection department, crediting the customer billed in error.

The customer who rightly should have been charged will have to be billed the following month, no doubt, causing him to complain about the delayed billing, if he had not already inquired regarding the failure to bill in the regular billing period.

If, as sometimes happens, the collection department is unable to ascertain that the number has been transposed, it may be necessary for policy reasons to allow the customer a credit, resulting in a loss of revenue and an unsatisfactory transaction from all standpoints.

You can readily see from this what a vast amount of grief and labor there is involved in what seemed a trivial error, not only from the standpoint of the customer served, great as this is, but from the standpoint of the different departments of the business affected.

Proper recording of information on toll tickets is vital from the standpoint of all employes handling toll tickets. As has been stated before, the recording of the correct telephone number is of paramount importance. The place called is vital in making proper billing to customers and in settlement work with joint and connecting companies. Time recording by means of the calculagraph, rating and grouping of toll tickets are all important phases of the operator's job.

Quite recently a ticket interpreted as Wausau, Wis., upon investigation was found to be Waseca, Minn. This looks like a trivial error, but when we stop to analyze just what took place in connection with this particular ticket, we begin to realize how important a matter it is to get the terminating station correct.

In this particular case this message was reported to the Bell company and the money paid over in accordance with the settlement, when as a matter of fact, the Bell company was not entitled to any portion of the call.

The matter of showing the proper terminating station affects directly the pocketbook of the reporting company, hence should be watched very carefully by the operating forces. The terminating station is the guiding factor in connection with the reporting of business between joint toll line companies.

Therefore, if our relations with connecting toll line companies is to be maintained at its best, the little matter of showing the correct terminating station on toll tickets must be carefully watched. A careful check-up each day by the chief operator would be time well spent. The practice of abbreviating stations makes this doubly important.

The matter of properly rating tickets cannot receive too much attention by the operating force. There is nothing so embarrassing for the commercial employe to discover and have to admit to the customer, than that a ticket has been rated incorrectly.

This not only inconveniences the customer, but creates a suspicion in his mind that is hard to overcome; and he is inclined to question future charges on the basis of the unhappy experience. Members of operating forces who have any spare time at different intervals during the day should at least use some of it in verifying the rating of tickets.

There is a chain of events that transpires from the time of recording the message until the ticket finally reposes in the file pending its destruction, which sounds fantastic to the uninitiated. If any one of the functions of tickets goes wrong, an irreparable amount of damage can be done.

Annual Report of Home Company of Fort Wayne, Ind.

Officers and members of the board of directors of the Home Telephone & Telegraph Co., Fort Wayne, Ind., were re-elected at the annual stockholders' meeting and organization meeting of directors held Monday, April 6. The officers re-elected at the directors meeting are: President, Frank E. Bohn; vice-presidents, August E. C. Becker, J. G. Crane and L. H. Moore, secretary, Otto Marahrens; treasurer, Max B. Fisher, and general manager, Otto Marahrens.

The members of the board include Charles M. Niezer, chairman, August E. C. Becker, E. C. Blomeyer, W. A. Bohn, Frank E. Bohn, V. E. Chaney, J. G. Crane, Max B. Fisher, G. B. Foscue, Otto Marahrens, E. C. Miller, William L. Moellering, L. H. Moore, B. Paul Mossman, and E. M. Wilson.

A summary of President Bohn's report to the stockholders follows:

"The year 1930, the 35th of the corporate life of your company, was the first year when it failed to grow in stations. However, the loss for the entire system was but 145 stations, 78 of which were in Fort Wayne and the remainder in the small exchanges. Fort Wayne has 34,018 stations and the outside exchanges, 3,636, making a total of 37,587.

The outstanding achievements of the year were the conversion to the dial system of Huntertown, Leo, Harlan, Churubusco, Monroeville, and Roanoke, the conversion of Kimmell to remote control operation, the installation of a two-position toll switchboard for Fort Wayne-suburban toll, and the placing in service of the new Eastbrook office unit, for the present consisting of 1,000 lines, located in the Anthony switchroom.

Records were broken during the year on the clearing of trouble. The number of cases carried over at night was reduced materially and the number of days in which no trouble was carried over increased from 99 to 164. Trouble clearing time was also substantially reduced. All of this means that the plant was maintained to a high degree of efficiency.

A counterless contract office was installed for the convenience and comfort of subscribers and the public, and is a most decided success.

Arrangements were made during the year for the installers, maintenance men, and inspectors to purchase and wear uniforms, which makes them easier to identify by the public, creates a most favorable impression, and works to the interest of the men in saving of their regular clothes.

Balance sheet totals increased $326,727.06 over 1929 and amounted to $6,520,019.11 as of December 31, 1930. The total net increase in fixed capital accounts is $333,083.10, of which $198,580.10 was for central office equipment. The depreciation reserve account increased $82,581.44 and was as of December 31, 1930, $924,952.88, which is 15.2 per cent of the total book value of the depreciable property account as of the same date.

During the year your company offered to the stockholders and sold an additional $500,000 of common stock, realizing therefrom cash to the same amount, which was used to retire short-term borrowings and provide additional working capital.

The year just past was a most trying one for all employes; yet all measured up to a high standard of efficiency and gave of their best in service, loyalty, and cooperation. Obviously such an organization is most invaluable, especially in times like the present. Therefore, too much credit cannot be given them."

Australia Linked with Three South American Republics.

Radio-telephone service between Australia and the three South American Republics, Argentina, Uruguay and Chile, was inaugurated recently, using the circuit which the International Telephone & Telegraph Corp. operates, in conjunction with the British postoffice, between Buenos Aires and Rugby, England, and the circuit operated by the British postoffice at Rugby and the Amalgamated Wireless Co. at Sidney, Australia. In Buenos Aires, this circuit will connect with the lines of the United River Plate Telephone Co.

Here and There in Telephone Work

P. B. X. Current Supply; Charging the Storage Battery (Ctd.).

By JOHN A. BRACKEN

A very simple method of charging P. B. X. storage batteries is to charge them direct from 110-volt direct current mains. In all P. B. X. battery charging equipment using direct current from the mains at 110 volts, some form of electrical resistance is necessary to connect into the charging circuit. The incandescent lamp is the simplest and cheapest form to use.

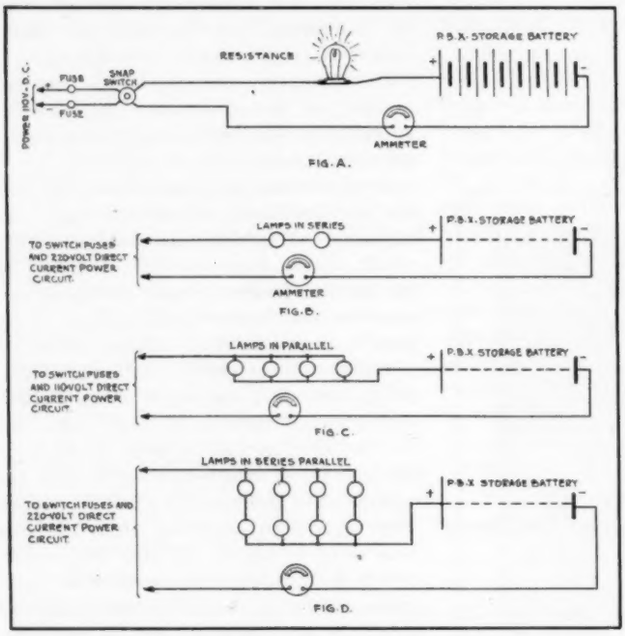
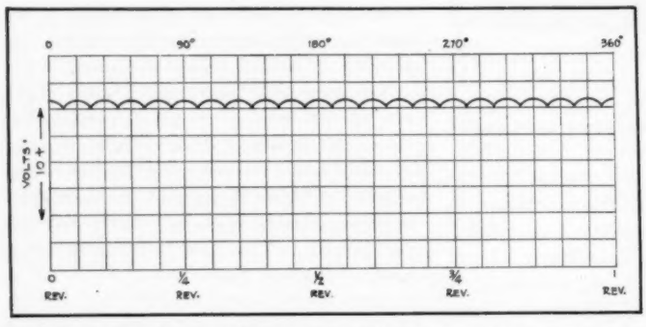


Fig. 1. Charging P.B.X. Storage Batteries from Source of Direct Current, Using Incandescent Lamps for Resistances.



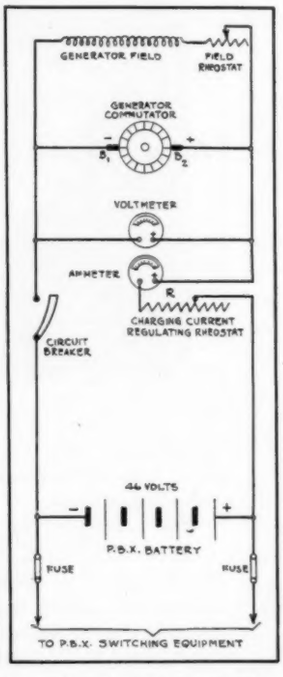


Fig. 2. Graph of Practically Constant E. M. F. Which Is Generated by Direct Battery Charging Dynamo—Fig. 3. Simple Arrangement of the Charging Generator Circuit.

Fig. 1-A shows the method of connecting a group of storage cells forming a P. B. X. storage battery with one lamp in the charging circuit. In this arrangement, the rate of charge is entirely dependent upon the size of the lamp bulb; in other words, dependent upon the amount of electrict current drawn by the lamp.

The charging rate with one lamp burning will be, roughly, the wattage of the lamp divided by the charging circuit voltage. That is, if a 60-watt lamp is used, the charging rate will be $I = W/E$ or $60 \div 110$ equal to about 0.54 ampere.

If 220 volts direct current only is available for charging purposes, the same general form of wiring is used, except that two 110-volt lamps are connected in series as shown in Fig. 1-B. Fig. 1-C shows a battery being charged through four lamps connected in parallel.

In this arrangement the charging rate is increased or decreased by simply screwing the lamp bulbs in or out of their sockets. If 40-watt lamps are used, the charging current can be adjusted at 0.36, 0.72, or 1.44 amperes. If 220 volts direct current is used, it is necessary to use more lamps connected in pairs in series. This is really a parallel-series connection, as shown in Fig. 1-D.

Certain types of P. B. X. systems are operated on a 48-volt basis, in which the battery is made up of 23 storage cells. Where the power supply is adequate, a small direct-current motor-generator set is used to charge the battery.

To generate the charging direct E. M. F. by means of the motor-generator set, many inductors—that is, windings or coils of copper wire—are properly arranged on a laminated (divided into thin plates) iron core so as to form an armature. The inductors are suitably connected together and to commutator bars on the armature.

To produce an E. M. F., this armature is rotated by the motor at a uniform speed in a magnetic field. Some of the inductors—not the same ones constantly but different ones at different instants of a revolution of the armature—are always cutting the magnetic flux (the total number of lines of magnetic force) of the generator field at the maximum rate; that is, cutting at right angles across the flux. Thus a direct E. M. F. is impressed on the commutator brushes as shown in the graph, Fig. 2.

A simple arrangement of the charging generator circuit is shown in Fig. 3, where the brushes, B_1 and B_2, on the commutator are connected to the positive and negative poles of the battery with an ammeter and a current regulating resistance, R, in series. The resistance, R, varies with the normal charging rate of the particular type of storage battery being charged. It may be in the form of a variable rheostat, as shown at R in Fig. 3, or in the form of a fixed value.

The resistance of the series charging rheostat, R, for a given P. B. X. battery may be determined by modifying Ohm's law to read R_1 and $R_2 = (E - e)/I$. Here E equals the generator E. M. F.; e, the battery voltage at the beginning of charge; I, the normal charging rate; R_1, the required resistance at the start of charge and R_2 the necessary resistance to complete the charge.

Suppose the battery in Fig. 3 has at the beginning of charge, an E. M. F. of 46 volts, and the generator E. M. F. is 65 volts direct current. Then the battery exerts a back pressure of counter electromotive force (counter electromotive force, abbreviated C. E. M. F., is an opposing E. M. F. which resists the electric current in a circuit. It is similar to the back pressure in hydraulics) of 46 volts on the generator, and the net effective voltage is $65 - 46 = 19$ volts.

Assume that the normal charging current value is 2.4 amperes, then $R_1 = (E - e)/I$ or $(64 - 46) \div 2.4 = 7.9$ ohms, the required resistance of the rheostat at the start of the charge. For the completion it will be $R_2 = (E - e)/I$ or $(65.0 - 57.5) \div 2.4 = 3.0$ ohms.

It will, therefore, be seen that in order to maintain the normal rate throughout the entire charging period, a rheostat re-

sistance will be required which will be variable between the limits of R_1 and R_2, or 7.9 and 3.0 ohms.

The value of a fixed resistance in the battery-charging circuit may be calculated approximately thus: $R=(E-ne)/A$. In which R equals the required resistance; E, the E. M. F. of charging current; n the number of cells in the battery; e, the E. M. F. per cell at 2.5 volts, and A, 50 per cent of the finishing charging rate in amperes.

Example: Suppose in the case just cited that the battery has a finishing charging rate of 2 amperes. Then the fixed resistance in ohms will be $R=\frac{E-(ne)}{A}$ or

$$\frac{65-(23\times 2.5)}{1}=7.5 \text{ ohms.}$$

To find the available E. M. F. or the resulting electric current against a resistance where there is a C. E. M. F., the C. E. M. F. must be deducted. For example, suppose a storage battery has an internal resistance of 0.8 ohm and a C. E. M. F. of 46 volts; and it is desired to charge the battery with a dynamo which gives an E. M. F. of 65 volts direct current at the battery terminals.

There are $65-46=19$ volts pressure against a resistance of 0.8 ohm with consequently a current of 2.4 amperes. It is evident that the C. E. M. F. has acted as a true resistance. In this case, $W=EI$ or 19 times 2.4 equal to 45.6 watts, were wasted in overcoming the resistance of the storage battery. The remaining 110.4 watts were stored up in the chemical changes they brought about in the active material of the storage battery.

"I Wonder Why," by an Observing Traveling Telephone Engineer.

By Ray Blain.

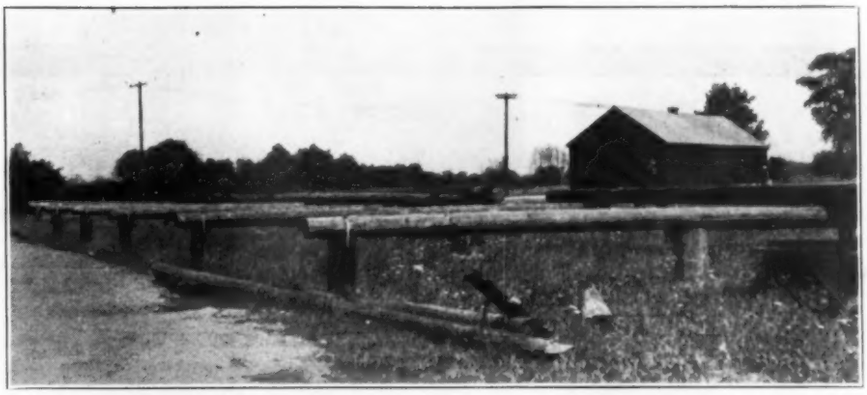
I wonder why the average telephone company does not provide more suitable means of storing poles in the yard?

The practice common with most companies is to place a few old poles on the ground as skids and pile the good poles on them in the easiest manner possible. This method will elevate the good poles from six to ten inches above the ground which will be reduced to four or five when the skids have had a chance to settle.

Weeds will grow up so as to cut off the circulation of air; and if poles are left in storage for some time it is not uncommon to find rot well started on the under side. Rot is also frequently found between the poles where moisture collects and does not dry out quickly.

Another disadvantage of this makeshift method of storage is that it is difficult to load on, or unload poles from, a truck or pole trailer.

It is a very simple matter to provide an inexpensive pole storage as indicated in the accompanying illustration. Old poles are usually available which are not suitable for resetting in the line but are good enough to build a pole rack about three feet above the ground. Old butts can be set in the ground a suitable depth, squared off at the top, and poles placed across them, which can be held in place by crossarm braces and through bolts.



Pole Storage Rack That Keeps Poles Dry and Free from Rot.

An arrangement such as this will not only keep the poles well off the ground where they will be subjected to currents of air to keep them dry and free from rot at all times, but will make the job of loading and unloading much easier and quicker.

When poles are piled on the ground it is not uncommon to drop one occasionally, which generally ruins the pole. This breakage alone will in most cases pay for the construction of the rack in less than a year.

Aids Nebraska Companies in Soliciting School Authorities.

Although press of time prevented the Nebraska legislature from taking up the proposal to require school boards to install telephones in all rural schoolhouses, the opportunity has not been passed up by the Nebraska Telephone Association. Secretary George M. Kloidy is sending out to all member companies an attractively-printed, four-page booklet for use in connection with the solicitation of school authorities for this business.

Charles W. Taylor, state superintendent of schools, has also sent out a letter to county superintendents, urging them to use their influence in getting telephones installed in rural schools.

The Lincoln Journal, the Omaha World-Herald and the York Republican have recently published articles urging the necessity of this kind of service in the interest of the safety of school children. These are reproduced in the Nebraska association's pamphlet. Astonishment is shown by the editors over the discovery that few rural schoolhouses are thus equipped, even in territory where the children travel long distances from home, through bleak and sparsely-populated sections that are subject to the terror of the blizzard, to district or consolidated schools.

One of these editors said: "Why should it be permitted to send children home through a blizzard? Why should supreme dependence be placed in a bus that may be ditched or incapacitated in the blinding storm? Why allow anyone to take chances with public charges who are confiding and helpless? In the schoolrooms they can be kept warm and safe, even though hungry, until the danger is past or succor comes. And why is there not a requirement that in every such school a telephone be installed so that the call for help may be promptly sounded?"

Another clipping reproduced in the pamphlet is from that Hays, Kans., News, which made an investigation and found out that there isn't a rural schoolhouse in the Hays telephone district which has a station installed, and expresses the opinion that it is unbelievable that such obvious protection to the lives of little ones has been overlooked. It calls attention also to the fact that tornadoes are a threat in the spring months, the fire risk is always present and there are many other unlooked-for dangers where an alarm ought to be sounded.

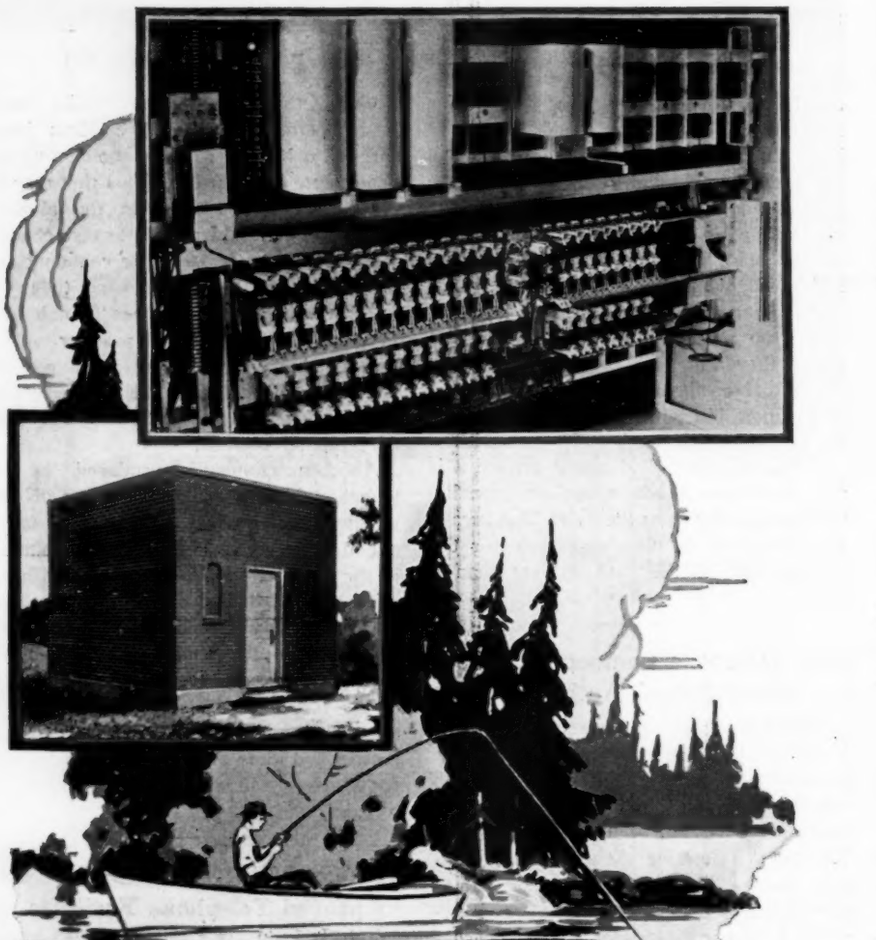
Jackson Hole, Wyo., to Have Improved Telephone Facilities.

The Jackson Hole region of Wyoming, long isolated by inadequate means of communication with the remainder of the state, will soon be traversed by a new $200,000 telephone line, according to Clyde L. Titus, state manager of the Mountain States Telephone & Telegraph Co.

Present telephonic communication with Jackson Hole from the outside is over a grounded line from Victor, Ida., to Jackson. The new line, the construction of which is already under way, will run from Dubois, Ida., to Moran, Wyo., and eventually continue on to Jackson and thence to Victor.

The line is expected to be completed by July 15. Thus, it will provide communication with the Jackson Hole country during the visit of President Hoover there during the summer if he should decide upon the Wyoming location for a summer White House.

IN REMOTE LOCATIONS—Stro



Interior View of Strowger Unattended Dial Equipment and Exterior View of Exchange Building at Three Lakes, Wis.

STROWGER Dial operation ut
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STROWGER AUTOMATIC DIAL SYSTEMS

GENERAL EXPORT DISTRIBUTORS
The Automatic Electric Company, Ltd., Chicago
In Canada · Independent Sales and Engineering Co., Ltd., Vancouv
In Australasia · Automatic Telephones Ltd., Sydney
In Japan · Automatic Telephones Ltd. of Japan, Tokyo
In China · Automatic Telephones of China Federal Inc., U. S. A.
In South Africa · Automatic Telephones (South Africa) Ltd., Johannesb

When writing to Automatic Electric Inc., please mention TELEPHONY.

...or Equipment Renders Unfailing Service

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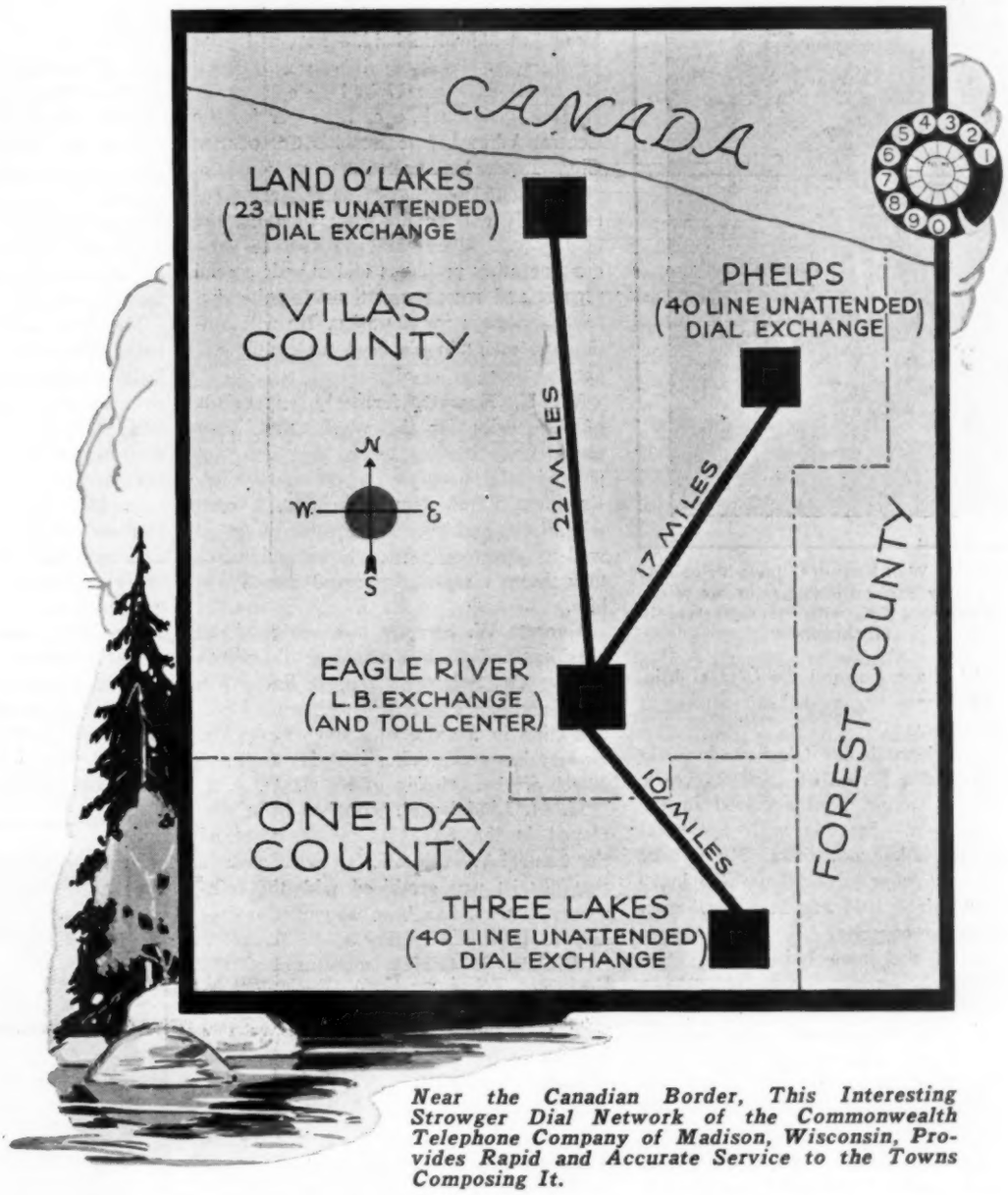


Near the Canadian Border, This Interesting Strowger Dial Network of the Commonwealth Telephone Company of Madison, Wisconsin, Provides Rapid and Accurate Service to the Towns Composing It.

Automatic Electric Inc.

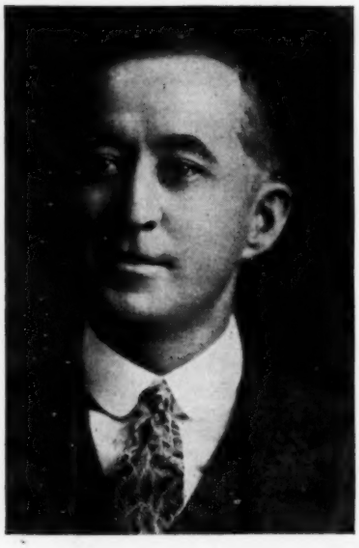
Manufacturers of
Strowger Automatic Dial Telephone and Signaling Systems
Factory and General Offices: 1033 West Van Buren St., Chicago, U.S.A.

ASSOCIATED COMPANIES
American Electric Company, Inc., Chicago
International Automatic Telephone Co., Ltd., London
Automatic Telephone Manufacturing Co., Ltd., Liverpool
The New Antwerp Telephone and Electrical Works, Antwerp
Eugene F. Phillips Electrical Works Limited, Montreal

When writing to Automatic Electric Inc., please mention TELEPHONY.

Personal Notes from the Field

F. G. Moore, of Newton, Iowa, has succeeded W. E. Hutchens as general manager of the Michigan Home Telephone Co., with headquarters in Muskegon. For the past three years Mr. Moore has served as general manager for both the Iowa State Telephone Co. and the Central Missouri Telephone Co., with headquarters at Newton, Iowa.



F. G. Moore, Well Known to Iowa Telephone Men, Is Now General Manager of the Michigan Telephone Co., with Headquarters in Muskegon.

His experience in the telephone business extends over a period of some 25 years, most of it having been acquired in the state of Iowa. Starting with a clerical position at Oskaloosa, Iowa, Mr. Moore worked up to a managerial position in 10 years, and since 1916 has been serving in an executive capacity. He is a former president of the Iowa Independent Telephone Association.

J. H. Glidden, formerly outside plant engineer of the West Coast Telephone Co., Everett, Wash., was recently made plant superintendent, reporting to Vice-President E. R. Hannibal. Mr. Glidden will have charge of the coordination and standardization of all plant work and practices in a staff capacity. All plant matters will be referred directly to him.

E. O. Wait, recently of Chicago, Ill., has been appointed manager of the Comstock Independent Telephone Co., operating some 300 stations at Comstock, Neb., and vicinity. Several years ago he served as lineman for the Comstock company, which was then operated by his father, the late E. B. Wait. Since leaving Comstock, Mr. Wait has been employed in Lincoln and in Chicago.

H. R. Christianson, who has been manager of the Iowa United Telephone Co., Albia, Iowa, since 1929, has been transferred to Newton, Iowa, as manager of the Iowa State Telephone Co. This is controlled by the Associated Telephone Utilities Co., which recently acquired the Iowa United company.

Mr. Christianson had previously been located at New Richland, Minn., and prior to going to Albia, had been at Sussex, N. J., all with the United Telephone Co.

H. A. Griesbach, area manager for the Central West Public Service Co. at Sac City, Iowa, has been appointed to the newly-created position of special representative. It will be his duty to assist the field forces, investigate and analyze various operating problems and submit special reports and recommendations for the district manager's consideration. He will continue to maintain his headquarters in Sac City.

W. E. Everett, formerly supervisor of directories for the West Coast Telephone Co., Everett, Wash., has been appointed sales manager, reporting to Vice-President E. R. Hannibal. Mr. Everett will direct and coordinate sales effort as well as directory work. Sales and directory matters will be referred directly to him.

Everett W. Sweezy has resigned as president and general manager of Utilities Service Co., Suburban Light & Power Co. and Suburban Power Co., Alliance, Ohio, operating in a score of Ohio cities. Mr. Sweezy has gone to Los Angeles to do research work in design of ice plants.

H. M. Lindekugel, who has been employed in the Sac City, Iowa, office of the Central West Public Service Co. since that district was combined with the Minnesota district, has been appointed secretary to District Manager E. B. Samp.

William J. O'Hea, secretary of the Rochester Telephone Corp., Rochester, N. Y., was recently elected president of the Rochester Better Business Bureau at a meeting of the board of directors.

Arthur W. Page has been elected a director of the American Telephone & Telegraph Co. to succeed the late Henry S. Howe. He is vice-president of the A. T. & T. Co. in charge of public relations.

Ben H. Snowdon, division manager, Yakima Valley division, Washington, Oregon-Washington Telephone Co, a subsidiary of the Allied Telephone Utilities Co., has been chosen international delegate from Sunnyside, Wash., to the International Congress of Rotarians, to be held in Vienna, Austria, June 22 to 28, 1931.

Mr. Snowdon has followed the telephone business in the West for over 20 years, starting as bookkeeper in the Pacific Telephone & Telegraph Co. at Spokane, Wash., in 1910. He resigned as division commercial engineer and chief clerk in 1920 to engage in the Independent telephone field, becoming part owner in the Libby-Troy Telephone Co. at Libby, Mont.

He was later part owner and manager of the Huntington Beach, California, Telephone Co., Calif., The Wall Street Bank of Spokane, Wash., and the Central Oregon Telephone Co., of Burns, Ore. The latter company has recently become a unit of the Allied Utilities Telephone Co.

H. M. Schumacher, the new president of the South Dakota Telephone Association, is manager and secretary of the Hanson County Telephone Co., Alexandria, S. D. He has been on the executive board of the association for several years and was vice-president for two years.

Mr. Schumacher was born in Dubuque, Iowa, September 1, 1881. His education included high school training in Alexandria, S. D., graduating in 1898. Up to 1915, when he took up electrical work, he was in the tailoring business with his father.

In 1920 he bought an interest in the Hanson County Telephone Co., which at that time had 228 subscribers. The number of subscribers of the Hanson County company has grown to 350 since Mr. Schumacher became manager and secretary of the company. Out of 22 rural lines running into the switchboard, 10 have been bought by the company. The company has expanded considerably under the leadership of Mr. Schumacher. In 1928 the equipment of the exchange was changed

H. M. Schumacher, of Alexandria, S. D., New President of the South Dakota Telephone Association, Entered the Field in 1920.

over from magneto to common battery.

Mr. Schumacher is a member of the Masonic lodge and the Lion Club. He was elected a director of the South Dakota association in 1925 and vice-president in 1929.

Manta J. Elder, chief operator of the Southwestern Bell Telephone Co., Ottawa, Kans., recently celebrated her 25th year of service in the telephone field. Miss Elder took up telephone work March 16, 1906, becoming associated with the Kansas City Long Distance Telephone Co., which was operating in Ottawa at that time. The company's offices were located over a drug store.

Miss Elder began training to be an operator but during an emergency she was put to work before she had received sufficient training to know much about the work. This made her work rather difficult at first but she quickly adapted herself to the job at hand. Girls learning to be operators are now given several weeks of special training, both voice and technical, before they are allowed on the regular shifts.

In 1915, the Kansas Long Distance Telephone Co. was bought by the Kansas Telephone Co., with W. P. Hemphill, of Kansas City, as manager for the Lawrence, Ottawa, Garnett and Cherryvale exchanges. The office was then moved from the location over the drug store to the present location on West Third street in Ottawa.

At that time the force of 30 girls who had been working for the old company was cut to 15, as improved equipment made it possible for fewer operators to handle the calls.

In 1926, the Kansas Telephone Co. was taken over by the Southwestern Bell Telephone Co., the local office becoming a part of that organization. Miss Elder has been chief operator at Ottawa since August 29, 1918. There are now about 30 girls on regular shifts to handle the territory of the Ottawa office.

Manta J. Elder, Chief Operator, Southwestern Bell Telephone Co., Ottawa, Kans., Recently Completed 25 Years of Service in Telephone Operating.

In addition to her many duties as chief operator, Miss Elder does some writing. She is well known to TELEPHONY's readers, having won several prizes for articles submitted. She is a regular contributor to the Southwestern Telephone News, the company's monthly employes' magazine.

C. W. Gottry, area manager in the Slayton, Minn., district of the Central West Public Service Co., with headquarters in Sac City, Iowa, has been transferred to a similar position at Sac City, Iowa.

F. W. Fink was elected general manager and assistant treasurer of the Christian-Todd Telephone Co., Hopkinsville, Ky., at the recent annual meeting of the company to succeed C. E. Woodruff. Mr. Woodruff was retired March 1, after having reached the age limit set by the company.

Obituary.

J. G. Watkins, Sr., founder of the first telephone system in Fort Worth, Texas, passed away recently at his home in that city at the age of 86. Migrating from Canada to the United States in 1882, he established the Pan-Electric Co., operating the first telephone system in Fort Worth. When this company, later, was sold to the Bell interests, Mr. Watkins entered the insurance business.

Lyman Green, division construction superintendent of the Michigan Bell Telephone Co. at Menominee, Mich., passed away recently as a result of a heart attack suffered while stopping at the Travelers' Inn, St. Ignace, Mich. Mr. Green had been with the company for 31 years.

John M. Hill, for more than quarter of a century an employe of the Dayton division of the Ohio Bell Telephone Co., passed away recently at his home near Gettysburg, Ohio. In 1905, Mr. Hill was employed as repairman for the Centerville exchange of the Ohio Bell. In 1909 he was transferred to Dayton as installer, continuing in that capacity until 1928 when he was forced to sever his connections with the company on account of injuries received in an automobile accident.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Changes Proposed in Wisconsin Public Utility Regulatory Bill.

Public utility representatives and members of the Wisconsin Railroad Commission have agreed upon amendments to a bill (S. 355) to revise the law regulating utilities, the chairman of the commission, Theodore Kronshage, Jr., told a joint meeting of the Senate corporations and taxation committee and the House judiciary committee on April 29.

The bill as introduced by Senator Duncan contained a provision that members of the boards of directors of utilities must be residents of Wisconsin, and this requirement has been eliminated, Mr. Kronshage said.

A mandatory provision for depreciation reserves was included in the original bill, he said, and this has been changed to authorize the commission to fix the reserve.

"The bill is now more satisfactory and much more workable than in its original form," Mr. Kronshage told the committees.

Hearing in Terre Haute, Ind., Rate Case Set for May 29.

The Terre Haute, Ind., telephone rate case has been set for final hearing and closing of the issues on May 29 by Special Judge Charles Bedwell. The case was originally set for final hearing on April 27 but on account of the absence of City Attorney Charles Crawford, who was called to Indianapolis in another legal case, postponement was necessitated.

The case was brought by the city of Terre Haute against the Indiana Public Service Commission on December 27, 1929, soon after the commission had granted an increase in rates to the Citizens Independent Telephone Co. Later the telephone company was made a defendant in the suit.

At the hearing held April 27 George W. Huffsmith, representing the commission, entered a motion that the general denial of all the charges as filed by the public service commission be withdrawn for the purpose of filing special pleadings, and this was done over the objection of the city of Terre Haute.

Mr. Huffsmith then entered the appearance of the attorney general's office for the sole and only purpose of testing the jurisdiction of the court over the commis-

sion, setting out that the service heretofore had on the commission was on the commission as a whole and that it should have been, under the law, service individually on each member thereof; that as 60 days had passed since the filing of the suit such service could not now be had.

Commission Settles Difficulties in Thedford, Neb., Territory.

Railway Commissioner Drake, of Nebraska, has evolved a solution to the problem growing out of unusual conditions in the territory in which the Thedford Telephone Co. operates. The difficulty was brought to a climax when J. R. Figard, owner of the exchange, filed a complaint against Thomas P. Hamilton & Sons, owners of the Hamilton-Thedford-Brownlee Telephone Co.

The defendant corporation is a privately-owned line extending from Thedford to Brownlee, serving 11 patrons. It also owns another line which extends from Thedford on the same poles for six miles, serving about nine persons. Mr. Hamilton is a well known rancher who took over the property a number of years ago, when it was about to abandoned by its owners, so that his ranches and those of his sons might get service.

Some of the subscribers were located in the small inland town of Brownlee. A druggist in the town operates a small exchange, with several farm lines, which develops some toll revenues.

Prior to 1925, Mr. Hamilton owned a small exchange at Thedford, serving five town subscribers. Neither Mr. Hamilton nor the Thedford company had a franchise, and in the race to get one, Mr. Hamilton lost out. He then abandoned town service under an agreement that in consideration of having his calls switched free at Thedford, the Thedford company should have all toll revenues on calls originating on his line.

Later, Mr. Hamilton built another line on the same poles and secured nine patrons, the company being known as the Antelope Valley Line. These patrons paid $1.25 a month, of which Thedford received 75 cents for switching.

When J. R. Figard purchased the Thedford exchange some months ago he notified Mr. Hamilton that because of the smallness of the toll revenues on his line to Brownlee he would have to pay 75 cents a month for switching. The patrons refused to pay this additional fee, and Mr. Hamilton then cut his line at Thedford and put in a terminal telephone in town that gave no toll or switching service.

He then installed a knife switch between his two lines, and when this was thrown all patrons on the Brownlee line could get Thedford without cost. He carried on the war to the point of asking for and securing a franchise to give service in Thedford. Mr. Figard then filed his complaint. Subscribers on the Brownlee line intervened, asking that both lines be declared common carriers, and demanding reconnection with the Thedford switchboard or that of Mr. Hamilton. Their example was followed by Thedford subscribers.

The commission holds that both are common carriers, and that while a court of equity might order the Hamilton contract carried out, it must take other matters into consideration, and might disregard it when the public interest is concerned.

The commission directs that Mr. Hamilton's company shall be granted authority to publish and collect a rate of $1.50 per month for all its patrons; that the Thedford company shall publish and collect a switching rate from the Hamiltons of 50 cents per month for each patron on both lines; that the Hamiltons shall be granted a toll rate of 25 cents for all messages from Brownlee to Thedford, or reverse, in all cases where the party sending or receiving the call is not a patron of the Thedford exchange or its switching lines.

The decision also states that the Hamiltons should be ordered to reconnect their Brownlee line to the Thedford exchange and remove other connections in Thedford, as well as the knife switch now in operation.

Legislation Affecting Nebraska Telephone Companies.

The Nebraska legislature adjourned on May 2, after four months in session, deadlocked over the matter of appropriation, the governor seeking to redeem impossible campaign pledges for reduction of state taxes and the majority of the legislature insisting on adequate appropriations for state institutions and activities. The house refused to adopt the Bryan budget, but supporters of the finance committee budget were unable, because of the governor's interference, to muster the three-fifths vote necessary to adopt it, although that vote was secured in the senate.

The governor had particularly sought to cripple the state railway commission by cutting in two the appropriations for litigation over rates and slashing the total allowed for salaries and wages, and the legislature sternly resisted, this among other reductions. A special session will be necessary late in the month to settle the controversy.

This battle overshadowed everything else, and little new legislation of importance was passed. The only one directly affecting the telephone industry has been signed by the governor and becomes a law on August 2 next. It grants to legally qualified telephone and telegraph companies the right to construct, operate and maintain lines along, upon, across and under the public roads of the state and upon and under state and privately owned lands, provided that such construction and maintenance will not interfere with the ordinary use of the lands or of such roads by the public and by owners, and that all aerial wires and cables shall be placed 20 feet above road crossings.

Companies are permitted to enter upon private lands to survey them, and where a right of way is appropriated the owner shall be compensated. Where the parties fail to agree, the company may exercise the right of eminent domain, being awarded what land is necessary and being required to pay for it whatever the appraisers agree upon, with the restriction that the lines may not cut across fields but shall be located only on section boundary lines where public property is taken and along property boundary lines adjoining public highways where private property is utilized. The company must pay all expense of surveying, court costs and reasonable attorney fees, when incurred.

If any part of the property thus acquired is unused or abandoned for a period of three years the right of way reverts to the property, but not to the owner, to protect future purchasers of such lands.

Proposed Rural Property Transfer in New York Approved.

The acquisition by the New York Telephone Co. of the properties of the West Berne Telephone Co., of West Berne, N. Y., has received the approval of the Interstate Commerce Commission, and a certificate issued to that effect.

The West Berne company owns and operates a telephone plant in Albany and Schoharie counties, New York, including an exchange at West Berne which serves approximately 146 subscriber stations. There is no duplication of plant or service. The systems of the two companies are connected and subscribers of the West Berne company have access to the Bell toll lines.

The section served by the West Berne company is rural in character, containing two small unincorporated communities, West Berne and Gallupville, with a total population of approximately 1,800. The territory lies 20 miles west of Albany, and is immediately adjacent to the East Berne and Altamont central office districts of the New York company.

Practically all the lines of the West Berne company are grounded, and the service has become most unsatisfactory. Transmission complaints on toll messages have been numerous. The West Berne company furnishes service between 6 a. m. and 9 p. m. only. During the night there is no dependable service.

The plant is in poor condition, and it is estimated that an expenditure of $8,000 will be necessary to replace the present grounded circuits with metallic circuits and for general reconstruction. The West Berne company is unwilling to provide the funds necessary for these purposes. The New York company is prepared to expend immediately any sum that may be necessary

to give these communities standard commercial service.

The size and character of the area served by the West Berne company, with its limitations as to station development, make it impracticable to operate the plant as a separate unit, and it appears that the consolidation of the plant with that of the New York company will result in improved service.

On October 27, 1930, the New York company contracted to purchase all the properties of the West Berne company, excepting its corporate and local franchises, leases of real estate, cash on hand and in banks, accounts due from subscribers and others, and contracts with subscribers, for $4,668.

An appraisal made by engineers of the New York company finds the reproduction cost new of the properties to be retained in service to be $15,500, and less depreciation, $10,630. The estimated reproduction cost new, less depreciation, of the properties to be retired from service is $4,740, and the cost of removing the retired property is expected to exceed its salvage value by $1,040. In 1929, operating revenues and operating expenses of the West Berne company were $2,407.87 and $1,842.56, respectively.

If the proposed transaction be consummated, the rates now in force will be continued in effect pending the completion of a reconstruction program. After the plant is rebuilt and good service installed, the rates will be the same as those in effect in other areas where the conditions are comparable.

Order in Oklahoma - Arkansas Company Toll Dispute with Bell.

In cause No. 8417, order No. 5469, the Oklahoma-Arkansas Telephone Co. vs. Southwestern Bell Telephone Co., the Oklahoma Corporation Commission on April 22 issued an order providing that the Southwestern Bell Telephone Co. shall remove its toll board now maintained in Poteau, Okla., insofar as it affects intrastate service, and restore such service between its toll lines and telephone exchanges of the Oklahoma-Arkansas Telephone Co. as existed prior to January 22, 1928, within the city of Poteau and the towns of Heavener, Howe and Wister.

The order prescribes rates the Oklahoma-Arkansas Telephone Co. shall receive as compensation for toll service handled in its exchange in connection with lines of the Southwestern Bell Telephone Co. The Oklahoma-Arkansas Telephone Co. was ordered within ten days of date of the order to make a bond for $2,500 to guarantee its compliance with terms of the order.

The order is signed by Commissioners E. R. Hughes and C. C. Childers. Chairman Paul Walker wrote a dissenting opinion expressing the view that the decision of the Oklahoma Supreme Court required unconditional removal of the toll board in Poteau. The view expressed in the order as signed by the other two commissioners is that it was the intention of the Oklahoma Supreme Court to order the commission to take action affecting only intrasate business of the companies involved.

This is a case which has been before the commission since late in 1927 and upon which several orders have been issued. It was carried to the state supreme court by the Oklahoma-Arkansas company. The court declared the commission in error in its orders and instructed it to issue a new order along specified lines. This is the order which has just been issued.

A. T. & T. Co. Authorized to Establish New Transatlantic Circuit.

Opening of a new transatlantic radio telephone circuit by the American Telephone & Telegraph Co., to operate on low frequencies, was authorized April 24 by the Federal Radio Commission. The new station will be located at Bradley, Me., and will communicate with Rugby, England.

The long wave channel of 68 kilocycles, formerly assigned to the government for its long-range communication, has been transferred to commercial service to enable its allocation to the company, it was explained orally in behalf of the commission. The new circuit will parallel that maintained by the A. T. & T. Co. on the long wave channel of 60 kilocycles, and will supplement three such services maintained on high frequencies which link the United States with every continent.

The transmitter for the new station will have "superpower" of 125,000 watts, and will cost in excess of $1,000,000. Long range radio communication for the most part is maintained in the high frequencies where the transmission costs are considerably lower, because greater distances can be covered with much less power.

The equipment for a comparable service to operate in the high frequencies with necessary extensive antenna arrays would cost about 60 per cent of the outlay entailed for a long wave circuit.

While short-wave communication is less expensive than the long-wave method, which requires cumbersome high-powered equipment, the latter has been found more reliable. Short waves ranging up to 23,000 kilocycles now are employed throughout the world for communication, relay broadcasting, television experimentation, and practically every other type of radio contact, and represent by far the largest portion of the available spectrum.

Long waves have inherently greater stability than the shorter lengths and are not hampered particularly by the effects of fading and other transmission vagaries which characterize the short waves. Magnetic storms, for example, have a deleterious effect on high-frequency communication, while the long waves are not affected by the same meteorological conditions. On the other hand, static impairs long wave contacts, with little effect on the short waves.

Nebraska Court Holds Neurasthenia Compensable Injury.

The Lincoln (Neb.) Telephone & Telegraph Co. lost out in the state supreme court in the case where it resisted an order of the state compensation commissioner that it pay T. E. Smith, a former employe at its Nebraska City exchange, $11.48 a week for life because of permanent disablement from an accident while at work. The company contended that as a matter of fact there never had been any accident, that the defendant was a malingerer, and had not been hurt.

Mr. Smith had been employed some years before by a local industry, and claimed to have been partly disabled in an accident. He made a lump sum settlement on the basis of a 25 per cent permanent disability.

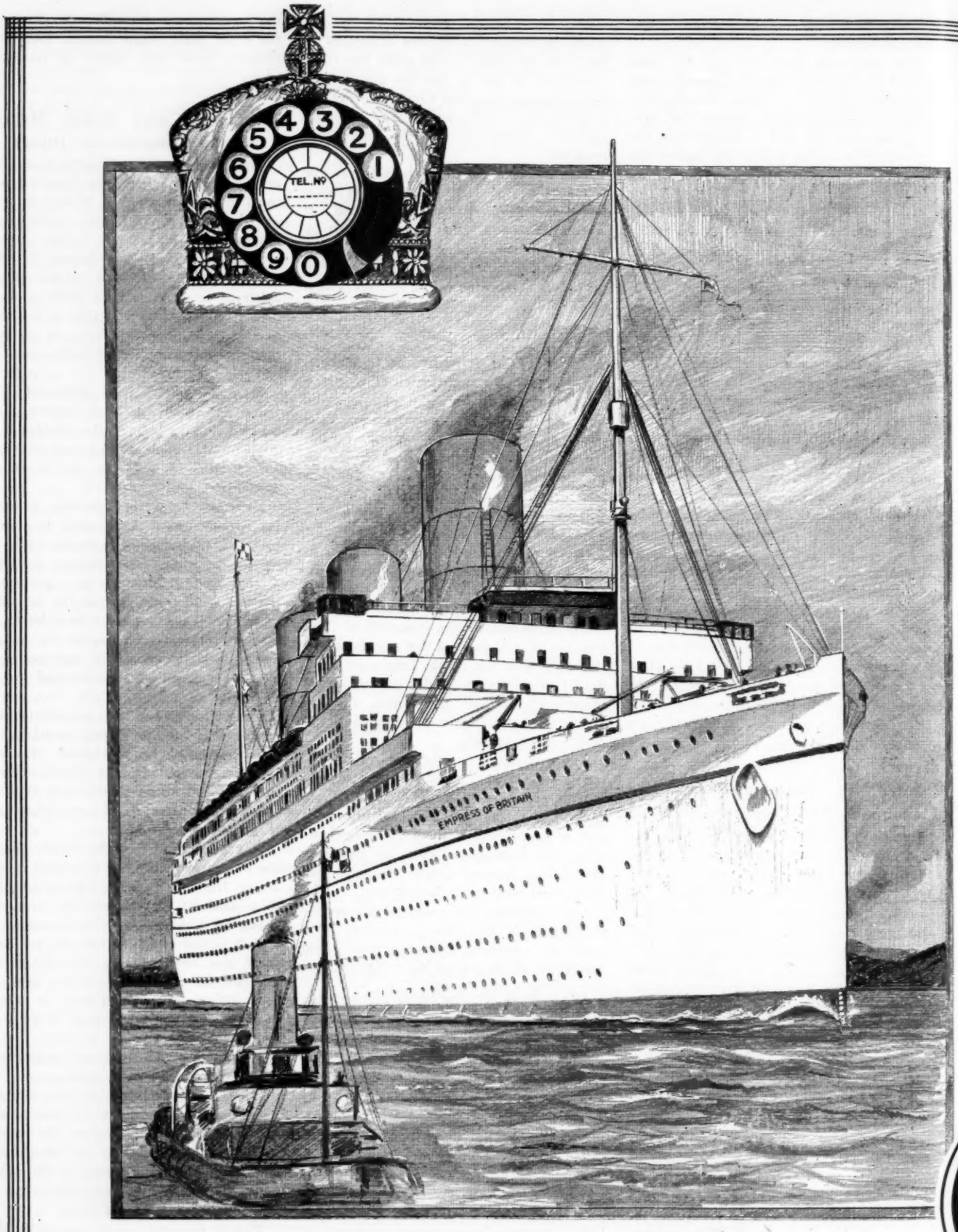
He worked for the telephone company for five months in 1929, when he claimed to have fallen down a stairway while doing janitor work. The company gave him prompt medical attention as a precaution, but has at all times claimed the defendant merely pretended to have been hurt, and that any present weakness of his spine is due to lack of exercise, to malingering, to unnecessary medical attention and to continued use of a brace.

The defendant had been warned the night before that his work was unsatisfactory and he resented this reprimand. The doctors disagreed; that of Mr. Smith claiming there was an injury to the spine that was not present after the injury four years before.

The court held that the better view of the evidence is that the defendant is suffering from nervous and mental disability as a result of the last accident, even conceding the contentions of the company. It says it is fair to infer from the evidential facts and circumstances that the mental and nervous consequences of the last accident still remain though there is nothing to indicate structural changes in the brain or nerves.

The court says that it will endeavor to protect employes from malingerers, but that where there is evidence that disabling mental and nervous afflictions have resulted from an industrial accident the burden should not be allowed to fall wholly upon employes and their families or the public, where the workmen's compensation law requires industry to bear a share.

This is the first recognition on the part of the Nebraska court of the doctrine or theory that neurasthenia is a compensable injury under the workmen's compensation act. It adopts the view of an English law writer that the effects of any accident are two-fold; they may be merely muscular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EMPRESS OF BRITAIN

A JEWEL IN AN EMPRESS'S CROWN

BRITAIN'S greatest shipbuilding and marine engineering achievement since the war, the beauty and luxury of the appointments of The Empress of Britain defy the powers of even the most accomplished of descriptive writers.

She is at present undergoing her preliminary trials and will leave Southampton on her maiden voyage to Quebec on the 27th of May; she will then be the largest, swiftest, and most luxuriously appointed vessel to ply between any two ports in the British Empire.

Strowger Automatic Telephone Equipment will provide service on board, and we are naturally proud of this minor, but nevertheless important contribution to the general efficiency of this wonder-ship.

AUTOMATIC TELEPHONE MANUFACTUING COMPANY, Ltd.
Strowger Works, Liverpool, England
ASSOCIATED COMPANY: International Automatic Telephone Co., Ltd., London

The stateroom telephones on board the Empress of Britain are furnished in various colours to harmonize with the general scheme of decoration.

effects, and they may also include nervous or hysterical effects, both arising directly from the accident, and that it is a fallacy to say that a man's right to compensation ceases when the muscular mischief is ended although the nervous or hysterical effects remain.

South Dakota Company Ordered to Establish New Rural Rate.

The Dakota Central Telephone Co., of Aberdeen, S. D., has been authorized by the South Dakota Railroad Commission to establish and place into effect on and after May 1 a net telephone rental rate for rural metallic party-line service not to exceed $2.00 per month per telephone, applicable to its Aberdeen exchange.

Permission was also given the company to bill its subscribers on its rural metallic lines 25 cents per month per telephone in excess of the net rate from which a discount of 25 cents shall be allowed where the rental is paid monthly in advance on or before the 15th of the current month.

The application of the Dakota Central company asked for authority to establish a net rental rate of $2.50 per station for service on rural metallic lines connected with its Aberdeen exchange. The company reported to the commission that it would be necessary to make certain of its farm lines metallic on account of power line interference and crosstalk caused by grounded lines paralleling each other for long distances.

On account of this additional investment, the company contended that a monthly rate of at least $2.50 would be necessary and that the subscribers on these lines had been interviewed and were generally favorable to the proposition.

The Dakota Central company serves approximately 5,500 stations at Aberdeen, over 400 of which are rural. Switching service is also furnished to 12 rural stations which are not owned by the company. Within the city of Aberdeen the exchange is completely automatic. The farm lines are magneto and until recently were all grounded return.

With the development of high voltage transmission lines, certain of these farm lines were either in whole or in part metallicized in order to eliminate inductive interference. Since Aberdeen is the largest town in this territory, farm lines were brought in for long distances in order to furnish switching service to the rural subscribers. Some have been extended approximately 30 miles, thus the stringing of additional circuits was quite expensive.

Some of the rural lines were overloaded because some subscribers insisted on being connected to certain lines. Testimony was presented at the hearing that approximately seven miles of these lines are paralleled by power lines carrying from 6,600 to 33,000 volts, which would undoubtedly cause serious disturbance in grounded telephone circuits.

An investigation of this matter showed that some of these subscribers were favorable to increased rates if the service were improved; also that some of the subscribers objected to the increase in rates and notified the company by petitions and personal interviews that they preferred the service which they had to the change contemplated with the proposed rate increase. Some of the reconstruction work had already been done at the time the hearing was held.

Prior to the establishing of this metallic service on the rural party lines south and west of Aberdeen, the net monthly rental was $1.25. This rate had been in effect for about 20 years. Out of 81 rural subscribers on these lines, 43 discontinued the service rather than pay a rate of $2.50 per month. After careful consideration, it was decided that the higher rate might result in a loss of most of the remaining subscribers and that a slightly lower rate would be more advisable.

Therefore, the commission issued its order that a net monthly rental rate of $2.00 for rural metallic service at Aberdeen is fair and reasonable.

Seeks Separation of Radio Companies; Not Dissolution.

The government does not propose to seek dissolution of the Radio Corp. of America in its suit against the radio "trust," but it will endeavor to separate the Radio corporation, the General Electric Co., the Westinghouse Electric & Mfg. Co. and the American Telephone & Telegraph Co. as "a combination in restraint of trade," Warren Olney, special assistant to the Attorney General in charge of the radio case, said on April 29.

The government suit naming the four companies is being brought in the federal court at Wilmington, Del., and will be heard in the fall.

As a result of the refusal by the United States Supreme Court to grant to the Radio corporation a review of the decision against the corporation in the radio tube case, the Federal Radio Commission asked its legal department for a ruling on Section 13 of the radio act of 1927, which "directs" the commission to refuse to renew the license of any company held to have violated the Clayton law.

The impression has gained ground in Washington that the question of the Radio corporation's status would eventually go to Attorney General Mitchell for a ruling, the commission not being satisfied that the meaning of the radio act is clear.

Notice was served on the Federal Radio Commission by Oswald F. Schuette, secretary of the Radio Protective Association, that if the commission renews communication licenses to the Radio corporation and to the National Broadcasting Co. for broadcasting the association will take the question into the courts.

Mr. Schuette admitted that it would take

(*Please turn to page* 43.)

New Liner's Telephone System

"Empress of Britain", to Sail from Southampton on Her Maiden Voyage May 27, Equipped with Powerful Telephone System; First Wireless System to Be Planned Before Ship Is Built

"Hello, Long Distance. I want Atlantic Ocean 0-0-0-1."

Somewhere, 2,000 miles out in the Atlantic deeps or 5,000 miles south by east in the Indian ocean, an alert operator in a receiving room forward of the center funnel on the sports deck of the new Canadian Pacific liner "Empress of Britain" will answer in a few minutes in a cool Canadian accent,

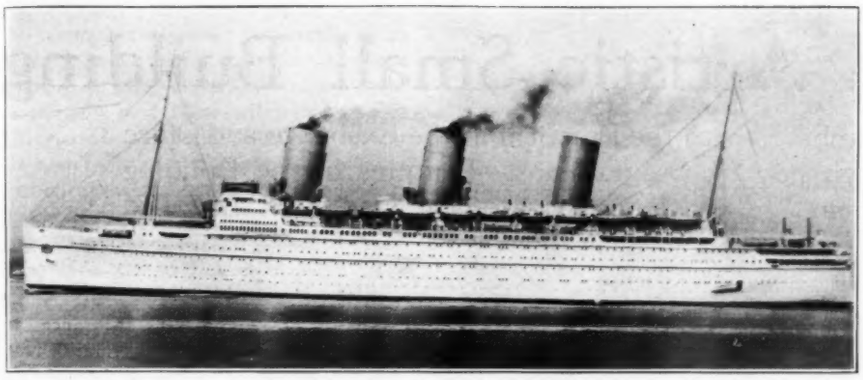
"Empress of Britain! You want Mrs. Frederic Jones? Just a moment until I ring her apartment. Mrs. Jones? Los Angeles is calling you. Go ahead."

And with no more effort than to lift the receiver from its cradle, the party is on the line in the world's newest, largest, and most powerful floating telephone exchange, so powerful that regardless of whether the new "Empress of Britain" is in mid-Atlantic on one of her regular April to December runs between Southampton and Quebec, or somewhere in the China sea on one of her December to April round-the-world cruises, long distance operators anywhere in the wide world can get her on the wire.

Electrical engineers who have inspected the wireless telephone installation on the new Canadian Pacific greyhound state that it will come closer to perfection than any installation yet made. The reason advanced is that this is the first trans-ocean or wireless telephone system to be planned before the ship itself was built, thus giving the telephone and wireless engineers an opportunity to plan and build their apparatus and make their installations where they will be most efficient, instead of having to fit them into a ship already crowded with gear.

The trans-ocean telephone equipment built into the "Empress of Britain" is sufficiently powerful to put her into instant and direct contact with any country having land stations equipped for sending and receiving radio telephone messages. It is a short-wave set. It is designed for quick adjustment to the wave length best suited for the reception of telephone messages at that particular spot.

London and New York will be the telephone "centrals" for the "Empress of Britain," the British operators connecting



"Empress of Britain" Easing Along at 30 Miles an Hour on Her Speed Trial in the Firth of Clyde When She Established a New World Record for Fuel Economy and Demonstrated That She Has the Most Powerful Telephone System of Any Ocean Liner.

trunk calls to subscribers all over Europe and the American land station being the junction for long distance calls to Canada, Mexico, Cuba, Central and South America, as well as the United States. Application has been made for the number "Atlantic Ocean 0001."

No need to ask for a particular person—he or she is absolutely certain to be at home! If the party wanted is not in his or her apartment, there are two soundproof and specially-ventilated booths located at strategic points on the ship, there are house telephones to more than 100 ship officials' stations on various decks.

The rate will be only $21 on the Atlantic for the first three minutes and $7 for each additional minute.

Extreme precision was required for the special instruments installed on the "Empress of Britain," because the ship is to cruise around the world each year from December to April, and, therefore, it is necessary to balance the service from port to port to insure regularity and uniformity of signals regardless of distance from shore terminals.

Special rooms were constructed exclusively to house this equipment, both of them located on the top or "sports" deck, the receiving room being just forward of the center funnel, as shown in the accompanying illustration, and the sending room is located at the after funnel. Separate antennae are used for sending and receiving, thus permitting two-way conversations.

Connected with the same system will be the ordinary telephone exchange of the ship, equal to the local and long distance service of a city of several thousand people all living in one apartment hotel.

Radio broadcasts heard from amplifiers on deck and in important public rooms will no longer be phonograph records played from a control room. The ship has all the equipment of a short-wave radio station and will both send and receive radio broadcasts from land stations all over the world and from its own orchestra. It should be a great voyage for DX radio fans.

The first commercial call placed from the United States is already booked for the Century of Progress Exposition executive committee, at Chicago, who will invite the "Empress of Britain" passengers to come to Chicago in 1933, the connection to be established immediately after the vessel leaves Southampton on her maiden voyage, May 27.

The new Canadian greyhound, or rather "whitehound," is the largest and fastest liner plying between any two British ports, has an express speed of 30 miles an hour, is 758 ft. long, 97½ ft. wide, 168 ft. from waterline to funnel tops, and 208 ft. from waterline to telephone antennae yardarms on the masts. Her Canadian port will be Quebec. She was built at Clydebank, Scotland, by John Brown Co., and launched by the Prince of Wales last year.

Rebuilt Exchange at Davenport, Neb., Cut Into Service.

With a newly installed, one-position magneto switchboard of the latest type, cut into service at Davenport, Neb., on March 14, the Lincoln Telephone & Telegraph Co. now affords its patrons all the advantages in modern communication. The Davenport exchange was purchased by the Lincoln company in March, 1928, from the Davenport & Kiowa Telephone Co. Mrs. Helen Harms is chief operator-cashier.

The installation of the new switchboard and central office equipment marks the completion of the company's program in Davenport which was started late in the fall of 1930. This work consisted of entirely rebuilding the city and rural outside plant, the placing of new central office equipment and remodeling the telephone office.

In keeping with the company's policy to better care for the telephone needs of the public in the 135 communities it serves and to have its employes work under the most desirable and convenient conditions possible, the telephone office at Davenport has been entirely remodeled and made modern in every respect. This work was done by R. Parks, contractor, of Bruning.

According to District Manager L. P. Young, Hastings, the new central office equipment which serves 250 rural and city stations, is equipped to care for the future growth of Davenport.

The installation of the new equipment was handled by J. Pugsley, chief switchboard installer, who was assisted by O. P. Knee, both of Lincoln.

Radio Telephone Development in the Philippine Islands.

Telephone communication between Manila and Iloilo in the Philippine Islands will soon be established. A branch line to Cebu will follow, thus completing the first radio telephone circuit connecting three of the principal cities in the islands.

Extensive tests have been conducted by the Philippine Long Distance Telephone Co. during the past several months, with satisfactory results. High government officials have used the temporary line in transmitting important instructions to provincial authorities in Iloilo when the telephone was considered the best means of getting the messages over. The tests were handicapped in the beginning by the presence of too much static, as the islands are in the midst of the so-called tropical static belt. However, the results of recent experiments have been favorable.

It is understood that the plans of the company call for the use of land lines wherever possible. Consequently, it is proposed to go as far south of Luzon as possible in the selection of a site for the wireless station. Another station will be established in Iloilo and a substation at Cebu.

In order to insure against interruption of the service when weather conditions are adverse to the carrying on of conversation by means of the radiotelephone, it is understood that resort will be made to submarine cables. The Philippine Long Distance Telephone Co. has about completed its construction program for central and northern Luzon. A direct line to Cabanatuan, Neuva Koija, was opened on March 4 and within a short time two branch lines covering the rice-growing district of Balacan and Nueva Ecija will be completed.

The company will next turn its attention to the establishment of telephone services to Laguna and Tayabas. With the northern program taken care of, it is expected that the establishment of radiotelephone communication to the Visayan Islands will be pushed through more vigorously.

The Philippine Long Distance Telephone Co. was recently awarded a certificate of public necessity and convenience covering the construction, maintenance, and operation of telephone exchange in the municipality of San Fernando, Papanga, and a toll station in the province connecting with Manila and all points where the company operates a telephone line.

Well-Planned Artistic Small Building

Architectural Beauty Combined with the Practical in the Exchange and Office Building of Osage Telephone Co., Osage, Kans.—Features of the Building of Spanish Type Design in Which Modern Equipment Has Been Installed

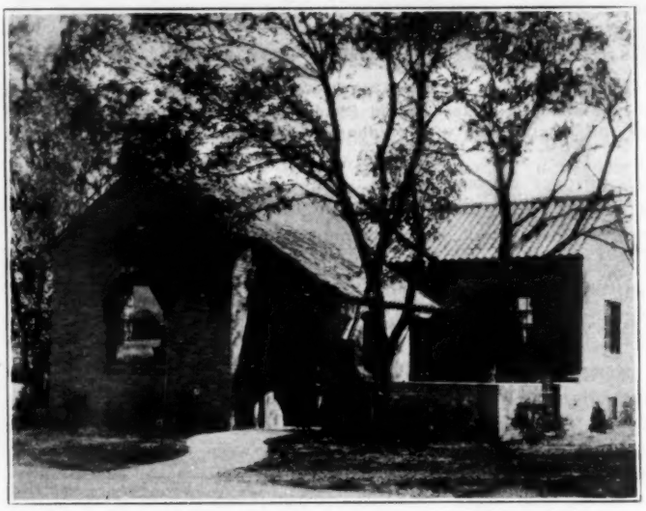
By P. Winemiller,
Sales Engineer, Stromberg-Carlson Telephone Mfg. Co.

An example of what can be done in the way of combining architectural beauty with a practical floor plan in a modern telephone building, is exemplified in the new quarters recently finished for the Osage Telephone Co. at Osage City, Kans. Too often the outside appearance of telephone buildings, especially in the smaller cities, is forgotten, with the result that while the interior of the building may be well arranged, one is not attracted by its outside appearance.

When the owners and operators of the Osage Telephone Co., E. C. Umdenstock and H. L. Ziegenbeim, decided to provide new and permanent quarters for the local exchange, they spent considerable time in looking over buildings constructed in the last several years and found none to their liking. So they took a decided step forward; and the result is that Osage City now has without a doubt one of the outstanding small exchange buildings in the United States.

By referring to the illustration, it will be noted that this building is a distinct Spanish type even to the patio in which a large elm tree stands. There is a full, concrete-wall basement under the entire building, the ceiling of which is in line with the basement window which is shown in the photograph of the building.

With the exception of the roof timbers, the building is fireproof, the floors being of steel and concrete construction. The roof is of colored tile, which is not only pleasing to the eye but everlasting in wear. Tan-colored bricks of several shades were used in the construction, and bright-colored awnings were placed on the windows exposed to the sunlight, all of which make a harmonious and pleasing appearance.



Beautiful Spanish Type Exchange and Office Building Recently Erected by the Osage Telephone Co. at Osage City, Kans.

Referring to the floor plan, it will be noticed that upon entering the building one comes into the lobby to the right of which is an open grill work window which may be closed at night and through which the patron may transact his business with the toll operator. Immediately ahead are two built-in sound-proof booths, both equipped with small windows. To the left is the accounting department and general offices. Entrance to the terminal room is through a door on the left side. From the terminal room there is an entrance to the operating room, as well as a stairway to the basement. Entrance to the operators' restroom is through the operating room.

It will be noticed from the illustrations that the Spanish type of architecture has been followed in the arrangement of the door openings and other features of the inside of the building. The basement, which has a ceiling height of eight feet, is divided into three rooms, one being used for fuel for the heating plant, which is a hot water system; one for a workshop and general repair room, and one for a battery room and general storage room. The batteries, being of the enclosed and sealed type, there is no trouble experienced from acid fumes.

Considerable thought and time were given to the selection of equipment that would not only be in keeping with this beautiful building but also would give fast and reliable telephone service. Some consideration was given to the convertible type equipment, but as the telephone company officials desired to give the ultimate in telephone service immediately upon completion of the new work, they were not long in arriving at a decision to install a completely modern feature common battery job.

Stromberg-Carlson Super-Service Switchboard Installed in the New Telephone Building at Osage City, Kans.—View of Relay Rack and Main Distributing Frame.

A competent engineer was employed to prepare specifications for the telephone company so that all manufacturing companies' bids would cover the same amount and type of equipment. The contract for this new equipment, as well as a sufficient number of central energy instruments to change every telephone within the city, was awarded to the Stromberg-Carlson Telephone Mfg. Co. of Rochester, N. Y. The equipment was installed by Charles Nichols of the Stromberg-Carlson installation department, on the tried-and-proved time-and-expense basis, thereby saving the purchaser quite a neat sum on installation costs.

The switchboard consists of three positions of Stromberg-Carlson company standard No. 3 unit type sections. The initial installation consists of 540 common battery lines, the first 300 lines being arranged for single party and the remainder for two-party on a jack-per-station arrangement. The local lines are arranged on a three-panel associated-multiple basis, there being two appearances of the 300 and 600 lines.

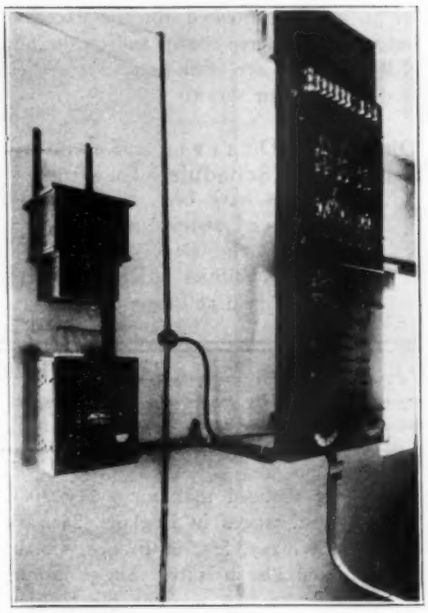
Sixty drop-ended magneto lines, of which 48 are for rural service, are installed. The multiples of these lines appear so that they may be reached by any operator. Position No. 1 has six high-efficiency toll combination cord circuits; positions Nos. 2 and 3 have 17 full feature universal cord circuits, the predominant features being keyless listening, machine ringing, reverting tone and secret service.

All key and plug shelves, as well as piling rails and apparatus blanks, are formica covered, a scheme that has been standard with the Stromberg-Carlson company for the past ten years and which is followed consistently in all switchboards manufactured by it, whether they be of the smallest magneto or of the large multiple type.

The increased cost of this type of construction and finish on key and plug shelves is more than offset by the lasting qualities which such a finish gives. The shelves retain their permanent black, glossy color indefinitely; and it is almost impossible to scratch or mar them, either from the impact of plugs, operators' head sets, pencils, knives, etc.

By referring to the illustration showing the terminal room, it will be noted first that the switchboard proper is installed in the partition separating the terminal room from the operating room. Access to any of the equipment in the switchboard, with the exception of the keys, may be gained without entering the operating room.

All cord relays are mounted on individual mounting plates and located in the terminal room on relay bays, the lower part of the bay being used for the cord relays and the upper portion of the bays for the line and cut-off relays. Mounting of the cord relays in the terminal room is a scheme developed and followed by the Stromberg-Carlson company, and has been found to be very successful in every way.



Converter, Charger and Power Panel in the New Telephone Building of the Osage Telephone Co. at Osage City, Kans.

A complete cord circuit may be removed without unsoldering of any wires. Additional cord circuits may be added up to capacity of the positions, which on the Osage switchboard is 19. All cord circuit relays are of the 200 angle armature type, and all line and cut-off relays are of the 190 compact type, of which there are in use up to the present time over 125,000.

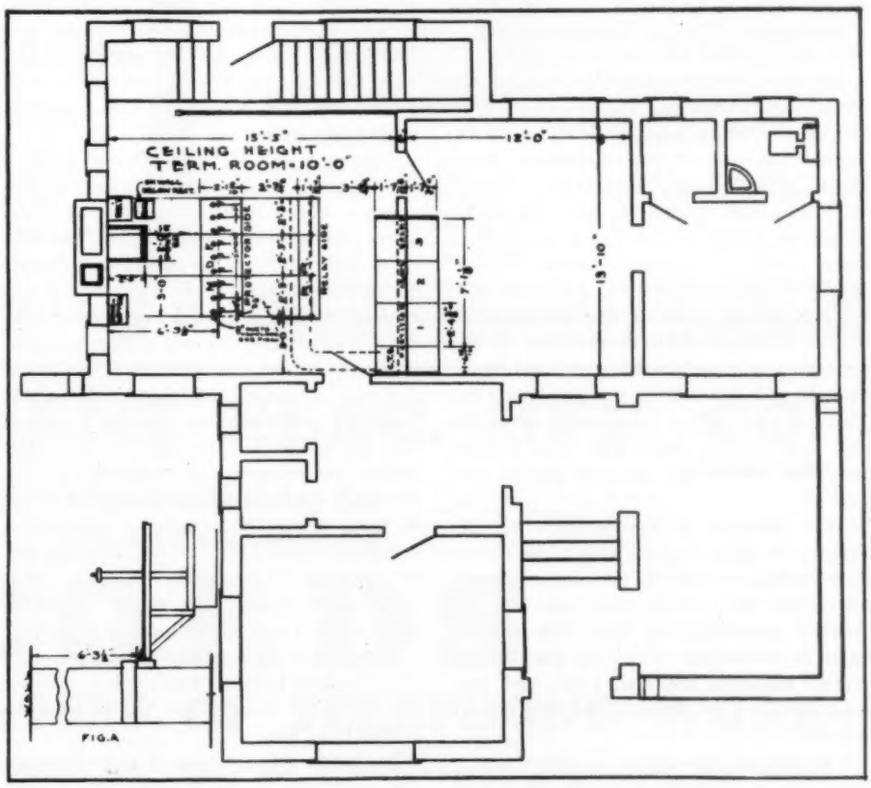
The Cook Electric Co.'s No. 100 type combined heat coil and carbon block protectors are used in connection with the city lines, and Cook H-36 combined fuse and carbon type are used with the rural and toll lines. The standard Stromberg-Carlson 2-B wire chief's test set, which is equipped with sufficient apparatus for making any test necessary in an exchange of this size, is mounted on the end of the main frame.

The power board is constructed of slate, and consists of two panels, 24 ins. by 36 ins. in dimension. All switches are of the Cutler-Hammer manufacture, and all meters of the Weston manufacture. The charging equipment consists of a Westinghouse tungar rectifier, so arranged that the main battery is trickle charged. Ringing current is supplied by duplicate Stromberg-Carlson 1-B 20-cycle converters.

The telephone plant at Osage City was first known as the American Independent Telephone Co., and was started in the year 1898 by J. H. Schwalm. Mr. Schwalm owned and operated this plant until the year 1906, when Mr. Umdenstock, who at that time was an employe of S. D. Thompson, owner of the Cameron, Mo., telephone plant, purchased it. Mr. Thompson is one of the old standbys in the Independent telephone game in Missouri and a staunch supporter of the Stromberg-Carlson company.

Mr. Umdenstock, after purchasing the plant in 1906, continued to operate it alone until 1908, when Mr. Ziegenbeim entered into the present partnership. These two men have owned and operated this plant up to the present time.

When Mr. Umdenstock first purchased the plant, the total number of city stations



Floor Plan of Spanish Type Exchange Building of Osage Telephone Co., Osage City, Kans.

consisted of 160 telephones. This number has been increased until today the telephone company has over 700 telephones in town and approximately 400 in the rural community surrounding Osage City. Practically all of the rural lines are owned and maintained by the telephone company.

The new equipment at Osage City was cut into service in the summer of 1930, and is giving service that is satisfactory to the patrons as well as the telephone company. The owners of the Osage Telephone Co. are to be congratulated for the excellent judgment they have shown and on the fine progress they are making in rendering modern telephone service.

Oklahoma District Telephone Meetings Scheduled for June.

Arrangements have been made for the first of a series of district meetings to be held this year by the telephone division of the Oklahoma Utilities Association. A meeting will be held at Beggs on Tuesday, June 9, followed by meetings at Hominy on Wednesday, June 10, and at Tahlequah, Friday, June 12.

These meetings will be held under the auspices of Sam Hand, manager of the Beggs Telephone Co., Beggs; Jack Walton, president, Oklahoma Telephone Co., Hominy, and R. I. Benzel, Oklahoma City, general manager for the Southwestern Bell Telephone Co. in the state of Oklahoma and vice-president of the telephone division of the Oklahoma Utilities Association.

With the Manufacturers and Jobbers

New Line of Paragon Time Control Switches Announced.

The Paragon Electric Co., Old Colony Building, Chicago, Ill., has just announced a new line of automatic time control switching equipment. The purpose of this equipment is to turn electric circuits both on and off on any desired schedule. The operation of the equipment is entirely automatic and the clocks are available in a great many different types to handle any special switching control demand.

The new Paragon time switches embody many features not contained in any other equipment of this kind. Simplicity of design and sturdy construction is the foundation on which these clocks are built.

Complete information on time control equipment can be obtained from the Paragon Electric Co.

Business Conditions in Great Britain; Taxes Burdensome.

People in the United States worry so much over business depression that they often forget that similar—or worse—conditions prevail all over the world. At the annual meeting of the Automatic Telephone Manufacturing Co., held at Liverpool, England, in March, Sir Alexander Roger, chairman of the board, referred to these conditions, especially excessive taxation.

"The selling price of our products includes raw materials, fluctuations of exchange, wages and restrictions, and taxation, largely a result of the war," said he, "but more recently a consequence of profligate and ruinous social and other legislation, for which all political parties are guilty.

"We investors in the business of this country are also electors, and, while in our own business we can do our share towards alleviating the troubles that surround the country generally, we must also take a hand in protesting effectively against excessive taxation, imperial, local, and municipal, which is crushing the life out of industry.

I am not an advocate of reducing wages, but I am an advocate of increasing output per person. The need for this is evident when it is realized that for every 100s. spent in real wages in England, 73s. are spent in Germany, 55s. in France, 45s. in Belgium, and 39s. in Italy. These figures, of course, take into account the relative costs of living. A calculation has also been made which shows that for every one pound's worth of production in Great Britain between 5s. and 6s. a year is spent in national and local taxation.

We appear to be easily the most highly taxed nation in the world at the present moment. Germany merely carries three-fifths of our tax burden, the American pays only one-half, and the Frenchman which compares reasonably with those prevailing elsewhere.

If these figures are correct—and I have no reason to doubt their accuracy—it is easily seen how difficult the problem is for British manufacturers, and ourselves among the number, to reduce their costs to such a point as will enable them to compete with freedom in foreign territory, and to maintain their prices in England at a point which compares reasonably with those obtaining elsewhere.

I do not suggest that all our national troubles are owing to conditions in this country alone; they are partly the consequence of world-wide depression, but it is quite apparent to me, and I am sure equally apparent to you, that this country at the moment is living upon its reserves, which is a position that cannot continue indefinitely.

Every investor—and that includes the humblest postoffice savings bank depositor and the holder of the smallest insurance policy—is interested in maintaining this country's credit and its trade, and nothing is more certain than that it requires a concerted effort by every one who has any sort of stake in the country to bring about a return in full of the prosperity which up to a few years ago this country enjoyed.

A writer in "The Times" stated recently that England today is making less sacrifice to retain her power than to increase the comforts of life.

So far as this company is concerned, we are putting our house in order with a view to reducing costs. We are constantly improving methods and machines and also extending research. We have a magnificent business and a reputation built up over a long stretch of years which is second to none in our industry both at home and abroad, and with our able and loyal staff we shall continue to deserve, and I trust receive, our full share of business that is going."

"Masterbuilt" Switchboard Now Available for Small Exchange.

"The Greatest Opportunity for the Smaller Exchange Owner" is the title of a folder published by the Kellogg Switchboard & Supply Co. and describing the 6-800 "Masterbuilt" Kellogg switchboard for the smaller exchange. This board, the bulletin states, was designed by Kellogg engineers after an exhaustive analysis of the problems of the smaller exchange.

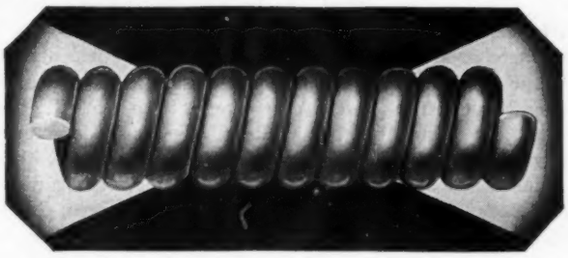
Alternately colored supervisory lamps with cords of corresponding colors are said to assure a prompt and accurate disconnect. A four-party ringing and listening key with each cord circuit is said to simplify the operation. Lamp signals are associated with local lines and drop signals with toll and rural lines.

All keyshelves and equipment blanks are faced with durable, black phenol fiber. The positional equipment is simple and flexible. The keyshelf, connecting rack and relay gate, are fully equipped and wired into a complete positional unit at the factory. It may be arranged for toll, local, rural or mixed traffic. Each unit is easily interchangeable with any other positional unit.

Copies of this bulletin may be obtained by writing the Kellogg Switchboard & Supply Co., Chicago, Ill.

Colored Monophone Window Display Attracts Public's Attention.

The Wabash Telephone Co., of Bloomington, Ill., of which T. C. Ainsworth is manager, has been utilizing modern merchandising methods in the form of the attractive window display shown in the accompanying illustration. The most attention-getting feature of the exhibit is not apparent in the illustration, namely, the va-



Galvanized Telephone Wire and Steel Strand

Crapo Galvanized Wire can be wrapped around its own diameter without injury to its pure zinc coating.... That is one of a number of reasons why **Crapo** Galvanized Telephone Wire and Strand can be depended upon to reduce maintenance cost.

Look for the **Crapo** Seal!

Indiana Steel & Wire Co.
Muncie, Indiana

Crapo
GALVANIZED PRODUCTS

TELERING

THE SUPER-RINGING MACHINE

Nearly 2000 already in use is convincing proof of the satisfactory performance of

TELERING
IT MUST BE GOOD!

Low First Cost
Negligible Operating Expense
No Radio Interference

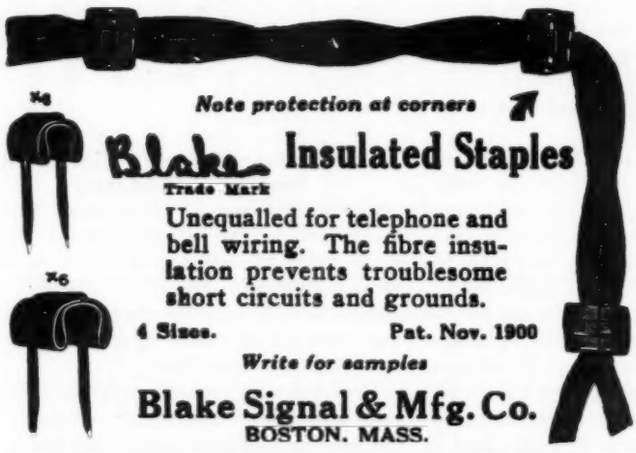
FULLY GUARANTEED!

Operated by Commercial Alternating Current

Price $44.00—F. O. B. Elyria
It Pays for Itself

Sold by Leading Telephone Distributors

TELKOR, INC., ELYRIA, OHIO
(Write for booklet)



Note protection at corners

Blake Insulated Staples
Trade Mark

Unequalled for telephone and bell wiring. The fibre insulation prevents troublesome short circuits and grounds.

4 Sizes. **Pat. Nov. 1900**

Write for samples

Blake Signal & Mfg. Co.
BOSTON, MASS.

Single Unit
POWER
for
Magneto Boards
from your light socket

LOW COST!
Consumes only a few watts

Write for Bulletin

Fansteel Power Unit, Type CAB-4, is a permanent power supply, replacing dry cells, or wet primary batteries. Simple—anyone can install and maintain it. Ample built-in storage battery reserve in case of A. C. line failure. Available at low price through your regular supply house, or order direct.

Fansteel Products Company, Inc.
NORTH CHICAGO, ILL.

RUNZEL-LENZ ELEC. MFG. CO.
ESTABLISHED 1904 **CHICAGO**

Specializing in Manufacture of

CORDS

FOR ALL CLASSES OF TELEPHONE WORK

Sierra Equipment Corporation, Los Angeles—San Francisco—Seattle—Pacific Coast Distributors

rious attractive colors in which the monophones are shown.

These convenient instruments are obtainable from the manufacturer, Automatic Electric Inc. of Chicago, Ill., in a wide variety of colors. These colors are not painted on, but are an integral part of the synthetic resin compound of which the instrument is formed. Consequently, the color can not chip or wear off, but will permanently retain its luster and polish throughout the life of the telephone.

Attractive Window Display of Wabash Telephone Co., of Bloomington, Ill., Exhibiting Monophones in Various Colors.

The sales appeal of the monophone is considerably enhanced with color, both for regular and extension use, and telephone companies find that the idea of matching the color scheme of a room with a colored monophone is becoming increasingly popular.

Runzel-Lenz Electric Mfg. Co. Elects Officers.

Recently, there has been a change in the officers of the Runzel-Lenz Electric Mfg. Co., Chicago, Ill. Following is a list of the new officers: J. M. Lenz, president and treasurer; P. C. Lenz, vice-president; and F. Racine, secretary.

Stromberg-Carlson's Annual Sales Conference at Rochester.

Seventy-five sales representatives of the Stromberg-Carlson Telephone Mfg. Co. returned to their headquarters this week after attending the company's annual sales conference at Rochester, N. Y. The conference was acclaimed one of the best ever held by the company and representatives were highly satisfied with the general theme of the convention.

The conference was opened at 9 a. m. on May 4 by President W. Roy McCanne, who greeted the representatives, after which there were talks on merchandising by George A. Scoville, vice-president and sales manager, and Benjamin Gross of Gross-Brennan, Inc., Stromberg-Carlson representatives in New York and New England.

The first part of the afternoon session was taken up by sales and merchandising discussions and was in charge of Harry A. Beach, radio sales manager. The latter part of the session was devoted to a technical radio discussion by Ray H. Manson, vice-president and chief engineer.

In the evening Benjamin Olney, acoustical engineer, spoke on "Radio Reproduction," followed by E. A. Hanover, vice-president and purchasing agent, on broadcasting and the Stromberg-Carlson hour, heard on the N. B. C. Blue network every Monday night. Immediately following Mr. Hanover's speech the representatives were taken to the broadcast studios to hear the Rochester Civic Orchestra broadcast the regular Stromberg-Carlson hour.

The morning session on May 5 was given over to advertising and sales promotion which included speeches by W. T. Eastwood, advertising manager; S. H. Hanford, L. A. Casler and B. T. Brown of the Lyddon, Hanford & Kimball Advertising Agency; H. A. Brennan of Gross-Brennan, Inc., and J. A. Frye of Frye-Glasser, Inc., Detroit, Stromberg-Carlson representatives.

In the afternoon talks on credit and finance were given by A. F. Gibson, credit manager, and E. C. Roworth, treasurer; and remote control developments and program service systems by Lee McCanne, F. C. Young and A. G. Schifino, engineers.

The evening meeting, conducted by C. W. Schafer, manager of the Chicago branch, was devoted to further discussions on program service equipment by C. H. Bergmann, R. H. Barger, sales engineers, and M. N. Levy of Gross-Brennan, Inc.

Virgil M. Graham, radio engineer; Ben Woodbury, telephone sales manager; and E. S. Browning, chief installer, spoke on Stromberg-Carlson police radio receivers. E. G. Eidam, assistant chief engineer and F. C. Young, development engineer, discussed the latest developments in telephony.

Wednesday, May 6, was given over to telephone subjects. In the morning talks were made by E. R. Stonaker, consulting traffic engineer; A. J. Roberts, manager of the Kansas City branch; John H. Levis, Jr., telephone engineer; P. Winemiller and J. P. Galligan, sales engineers; E. S. Browning, chief installer, and A. O. Stigberg, planning engineer.

In the afternoon addresses were made by J. S. Gibson, merchandise manager; H. T. Brinton of the Habershaw Wire Co.; J. E. Finley, sales representative; C. D. Kinne, sales engineer; C. A. Sweet, sales representative; and S. K. Beecher and R. C. Reno, advertising department.

The annual sales conference banquet was held in the evening, during which an interesting program was given.

The following special salesmen were present: J. T. Barrett and F. N. Anibal, Rochester; J. E. Finley, Columbus, Ohio; C. W. Watson, Albany, N. Y.; Elliott Lauderdale, Hamburg, N. Y.; W. C. Caldwell, St. Paul, Minn.; J. D. Kratz, Milwaukee, Wis.; B. H. Merriman, Marshalltown, Iowa; W. J. Pfaender, Peoria, Ill.; J. R. Thompson, Grand Rapids, Mich.; and T. C. Thompson, Ashland, Ohio.

Among the Stromberg-Carlson representatives and their salesmen and branch managers who attended the conference were: Garnett Young & Co., Los Angeles, San Francisco, Seattle, and Portland; F. G. Larkin, Paul D. Myers, Inc., Indianapolis; Paul D. Myers and C. A. Foster, Scoville Mercantile Co., Atlanta; F. C. King and S. H. Manson.

Kansas City office: C. A. Sweet, J. P. Galligan, P. Winemiller, A. J. Roberts, C. D. Kinne, K. G. Gillespie, A. B. Preble, J. E. Wilkins, D. L. Rochon; Toronto office, S. A. McPhail, J. W. McNair, J. A. Berger, A. M. McDonald, John MacKay, L. E. LaFleur, H. L. Fallis, F. L. Grout, and N. W. Baldwin; Chicago office, C. W. Schafer, H. T. McCaig, M. W. Redmond, E. F. McCord, MacHenry Schafer.

Cable Splicers' Wiping Cloths with Improved Features.

Geo. E. Williams, of Minneapolis, Minn., is engaged in the manufacture of high-grade cable splicers' wiping cloths in improved patterns. His line consists of formed-flexible finishing cloths, flat finishing cloths, catch cloths, crotch cloths and upright joint catch cloths.

The cloths are manufactured of world-prize herringbone ticking, or certified imported Englished moleskin. They are patterned and manufactured by expert workmen. The manufacturer states that they are made to embody several improved features not be found in the old style cloths. Further information relative to this complete line of wiping cloths may be obtained by writing Geo. E. Williams, 3 East 26th street, Minneapolis, Minn.

Curtin-Howe Corp. Moved to Chrysler Building, New York.

The Curtin-Howe Corp. announces the removal of its executive offices to the Chrysler building, 405 Lexington avenue, New York City. The company's former officers were located at 415 Lexington avenue.

After the resistance from the strap to the fault, or resistance from the bridge to the fault of the bad wire, is obtained, this value may be converted to distance by multiplying by the "feet per ohm" for the particular gauge cable.

Gauge	Feet per Ohm per Wire	Ohms per 1,000 Wire Feet	Ohms per Loop Mile
24	38.97	25.66	271.0
22	61.75	16.25	171.0
19	124.0	8.05	85.2

Fig. 11. Telephone Cable Resistance.

Fig. 11 is a table of telephone cable resistances for the three gauges of cable commonly used. These values take into account the additional length of a cable pair due to its twist and lay.

Equipment Tests.

Equipment tests are essential to insure that central office apparatus will operate satisfactorily under the various conditions to which it is subjected.

On magneto lines, such tests consist in testing each drop to see that it will operate under a minimum current flow condition. Fig. 12 illustrates how such a test can readily be made, by ringing down each drop from the main frame, using a resistance in series with the ringing current source.

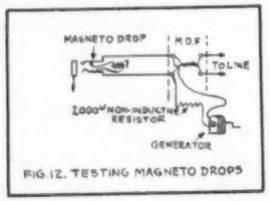


FIG 12. TESTING MAGNETO DROPS

Ring off drops can be tested in a similar manner.

On magneto lines terminated on a common battery board with universal cord circuits, the supervisory circuit should be tested under the same conditions as the magneto line drop.

Common battery line relays can be readily tested for marginal operations, by the use of a plug and limiting resistance arrangement as shown in Fig. 13. The plug is merely plugged into each common battery line jack; and all line relays which fail to pull up, are listed and later adjusted.

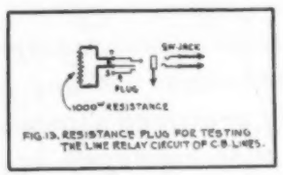


FIG. 13. RESISTANCE PLUG FOR TESTING THE LINE RELAY CIRCUIT OF C.B. LINES.

The value of the resistance used should be such that it will represent the worst condition under which the subscribers' loops operate.

The proper functioning of the cut-off relay can be checked by having an operator place the test plug (attached to the wire chief's voltmeter) in each common battery line jack; and then testing, by means of the wire chief's voltmeter, the tip and ring for ground and battery. The sleeve of the test plug should be so connected as to operate the cut-off relay.

Cord circuits should be tested under limiting conditions by plugging into special jacks and connecting a shunt resistance across the tip and ring.

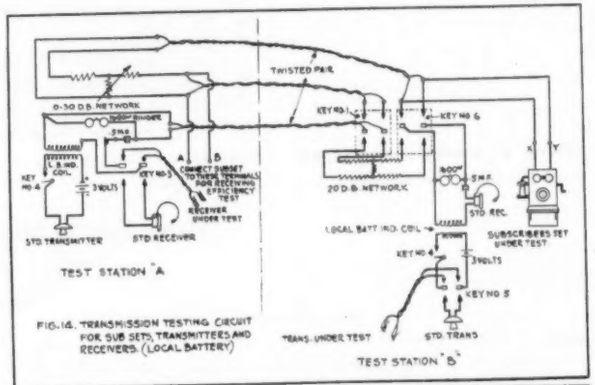


FIG. 14. TRANSMISSION TESTING CIRCUIT FOR SUB SETS, TRANSMITTERS AND RECEIVERS. (LOCAL BATTERY)

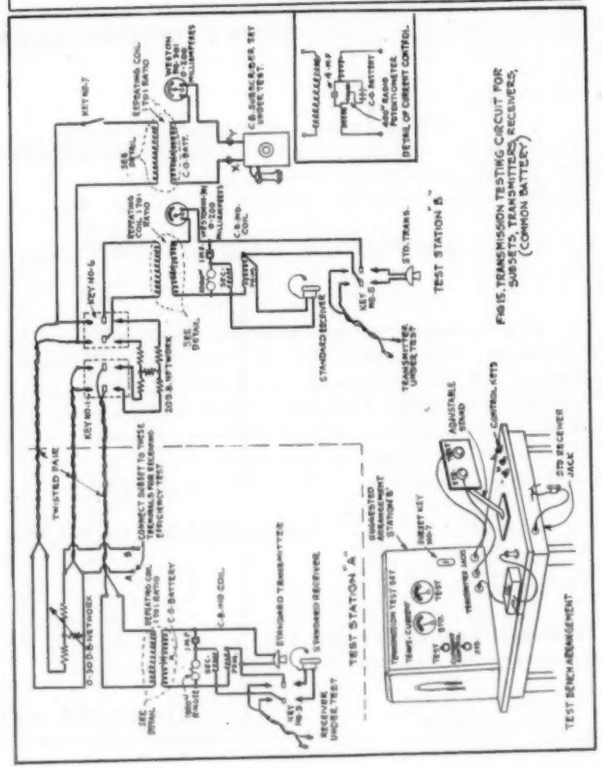
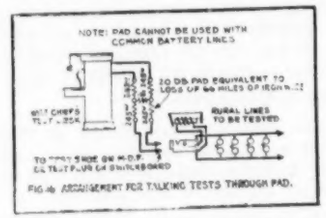


FIG. 15. TRANSMISSION TESTING CIRCUIT FOR SUBSETS, TRANSMITTERS, RECEIVERS, (COMMON BATTERY)

Transmission Tests.

Every exchange should be equipped with a transmission testing pad arrangement. The purpose of such an arrangement is to increase the overall transmission equivalent of the circuit being tested to some value approaching 30 db., as subscribers' loops having excessive losses are more readily picked up when making talking and listening tests under limiting conditions. Fig. 16 shows an arrangement for making this test.


NOTE: PAD CANNOT BE USED WITH COMMON BATTERY LINES
20 DB PAD EQUIVALENT TO LOOP OF 60 MILES OF IRON
RURAL LINES TO BE TESTED
TO TEST SIDE OF M.D.F.
OR TEST PLUG OF SWITCHBOARD
FIG. 16. ARRANGEMENT FOR TALKING TESTS THROUGH PAD.

The test consists in merely talking to either the subscriber or a troubleman at the telephone to be tested, and noting whether satisfactory conversation can be carried on.

Transmission tests using a regular Western Electric transmission measuring set will not be described in this data sheet.

The theory of operation of the transmission comparison circuit, Figs. 14 and 15, is as follows:

The circuit contains two branches, one of which has in series with it a resistance network having a 20 db. fixed value, and the other branch a variable network with a range of from 0 to 30 db.

The subscriber's set, or transmitter, to be tested is connected to the input end of the variable loss network, and a standard subscriber's set is connected to the input of the fixed network. At the listening or output ends of the two networks, a standard subscriber's set is arranged to be thrown to either network by means of a double-pole double-throw cam key.

In operation, a talking tester at Station B talks alternately into the standard transmitter and the transmitter of the subscriber's set under test. The listening tester at Station A, by means of the switching key, follows the talking tester as he changes from one transmitter to the other; and by carefully observing the volume received over the fixed branch, he then adjusts the variable network until the same volume is received over the variable branch.

The transmission efficiency of the set under test, as compared to the standard transmitting circuit, is then determined by subtracting the loss in db. of the fixed network from that of the loss in db. cut into the variable network. If a greater loss is cut into the variable than in the fixed

(Over)

MANUFACTURERS' LITERATURE

The following is a brief description of recently published bulletins, catalogs, etc. If you are interested in obtaining copies address your request to the manufacturer.

Notices Not Previously Published

POLE SETTERS

"Highway Model D Earthboring Machine and Pole Setter" is the title of a 4-page bulletin describing and illustrating the application of this equipment on any 1½ or 2 ton truck and its uses. **Highway Trailer Co., Edgerton, Wis.**

RINGING CONVERTERS

Bulletin No. 150 entitled "Leich Ringing Converters" describes and illustrates converter equipment for producing ringing current; this includes harmonic converters, ringing frequency converters and ringing converters with charger equipment. **Leich Electric Co., Genoa, Ill.**

Notices Previously Published

ADVERTISING MATERIAL

A 4-page bulletin describing and illustrating "new subscriber" and "extension" folder forms for business-building, also effective newspaper cuts. **Kellogg Switchboard & Supply Co., 1066 W. Adams St., Chicago, Ill.**

CREOSOTED WOOD CONDUIT

Circular of 8 pages entitled "Report after 40 years service of the condition of the Wyckoff creosoted wood conduit carrying the wires of the New York Telephone Co. from 1887 to 1929." Also 10-page circular describing this conduit. **The Wyckoff Pipe & Creosoting Co., Inc., 522 Fifth Ave., New York, N. Y.**

When writing please mention TELEPHONY

DRY BATTERIES

A 4-page envelope insert concerning the manufacture of Victor Telephone Cells. **The Carbon Products Co., Lancaster, Ohio.**

EXCHANGE EQUIPMENT

"Stromberg-Carlson Installations," a 32-page booklet composed entirely of reproductions of Multiple S-C Installations in all sizes of exchanges from the A and B boards of large city multiple exchanges to the small village junior multiple. The photographs show power, battery, relay, and terminal equipment as well as the switchboards themselves. **Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.**

LINE CONSTRUCTION EQUIPMENT

A new catalog giving full specifications on winches, derricks, trailers, power take-offs, earth boring machines and line construction trucks. Thoroughly illustrative and descriptive. **Four Wheel Drive Auto Co., Clintonville, Wis.**

SWITCHBOARD LAMPS

A leaflet and blueprint specifications describing Electrical Testing Laboratory reports on switchboard lamps. **Nilco Lamp Works, Inc., Emporium, Pa.**

SWITCHBOARDS

A 4-page folder describing the "Masterbuilt" switchboards for the smaller exchange. **Kellogg Switchboard & Supply Co., Chicago, Ill.**

When writing please mention TELEPHONY

"Telephony's" Engineering Data.

By B. C. Burden.

network, then the subscriber's set under test is better than the standard set; and if the loss cut into the variable is less than that in the fixed, the subscriber's set under test is poorer than the standard.

In testing the efficiency of individual transmitters of the same make as the standard set, the same plan as just described is followed, with the difference that the transmitter under test is substituted for the standard transmitter by means of a switching key; and at the same time the substitution is made, the standard subscriber's set is thrown from the fixed network to the variable network by means of another switching key.

The receiving efficiency of a complete subscriber's set, or of individual receivers, is accomplished by transmitting alternately over the variable and fixed networks using the standard subscriber's set, and adjusting the variable network to obtain the same volume in the receiver under test as in the standard receiver.

The transmission comparison circuit has the following uses:

1. To determine if telephones being purchased offer as good transmission as others which might be purchased for the same money.
2. To test repaired transmitters, receivers, or complete subscribers' sets which have been taken out of service to determine if the equipment is suitable for re-use.
3. To determine the effectiveness of various types of repair work, such as magnet charging (receivers), faulty air-gap adjustment in receivers, transmitter adjustments, etc.
4. To test the grade of transmission that is rendered under various service conditions, such as long common battery loops with low current supply, the effect of eavesdropping by subscribers on rural lines, etc.

Recommended Equipment.

The following list indicates testing equipment which every telephone company of any size should have available. While some of the items recommended may seem rather high in first cost, it should be borne in mind that with reasonable care they will last many years, and that the investment of a few hundred dollars in testing equipment to permit of properly maintaining an investment of from $15,000 to $50,000 is certainly warranted.

Wire chief's voltmeter arrangement.
Leeds & Northrup dial type Wheatstone bridge.
Portable ohmmeter, or circuit tester.
Portable telephone.
Inductive tone fault locator.
Transmission comparison circuit arrangement.
Transmission pad in wire chief's circuit.

Condensed Telephone News

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items Relating to Construction, Rebuilding, or Changes in Their Plants and Systems

Telephone Companies and New Incorporations.

DOVER, DEL.—The Associated Telephone Management Co. has changed its name to the Associated Telephone Service Co., Chicago.

BUTLER, IND.—Articles of incorporation have been filed by the Indiana Standard Telephone Corp., of this place, with a capital stock of 2,500 shares having no par value. The object of the company is to operate telephone exchanges, plants and systems in Indiana.

The incorporators are Frank C. Dunbar, John S. Powell and Will H. Adams.

MASON CITY, IOWA.—Notice of renewal of incorporation has been filed by the Pleasant Hill Telephone Co. for authority to operate a telephone system in Cerro Gordo county.

The amount of the authorized capital stock of this company is $10,000. The renewal duration is regulated to commence August 1, 1929, and continue 20 years thereafter with right of renewal, unless sooner dissolved as provided by law.

The following shall be directors and officers: P. P. Steil, president; Wm. T. Brakel, vice-president; H. D. Siewertsen, secretary and treasurer; J. W. Steil, W. G. Wilhite and J. S. Wilcox, directors.

CAMPBELLSVILLE, KY.—Papers of incorporation for the Campbellsville Home Telephone Co. with a capital stock of $25,000, were filed recently.

The residents of this town are heartily in favor of the organization of the new telephone company.

The incorporators are John J. Jeter, J. R. Sanders, J. A. Hubbard, O. C. Ramsey, John W. Ramsey, J. P. Gozder, J. T. Mardis and S. P. Rice.

LAKEVIEW, ORE.—Following the filing of tariffs with the Public Utility Commissioner of Oregon by the West Coast Telephone Co., increasing rates for service to farm-owned lines, L. R. Robertson and others, representing the farmers, formed the Valley Mutual Telephone Association.

The new association has applied to the council for a 25-year franchise in Lakeview. Tentative plans contemplate 500 stations and the use of dial equipment for both town and rural lines.

PUNGO, VA.—The Princess Anne Telephone Co., Inc., has filed articles of incorporation. E. S. Capps is the incorporator.

Franchises.

BRADENTON, FLA.—The franchise of the Peninsular Telephone Co. will be extended 30 years as the voters recently approved the extension. The ballot was 312 for and 210 against the extension which was asked by the company several weeks ago.

DENISON, IOWA.—After long considering the provisions, the city council has set May 19 as the date for the voters to pass on the request of the Western Telephone Corp. of Iowa for a franchise to use the streets of this city for its business.

The council demanded a number of concessions not set forth in the first ordinance which the telephone company presented and these were granted. Dow City, where the Northwestern Bell has an exchange, has refused the company a franchise at two elections.

EARLY, IOWA.—By a vote of 127 to 59, the voters of this place recently defeated the proposition of granting a telephone franchise to the Central West Public Service Co. for a period of 25 years.

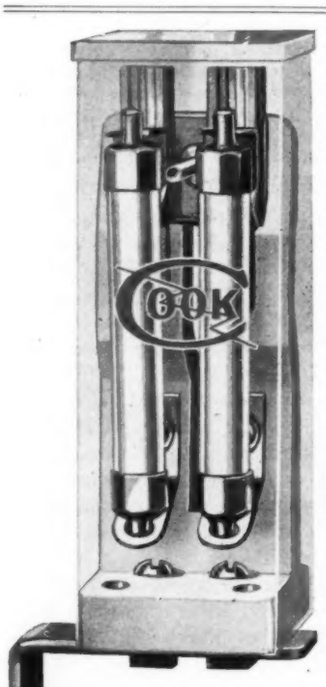
ROWAN, IOWA.—The Northwestern Bell Telephone Co. was granted a new franchise at the recent election. There were only two dissenting votes.

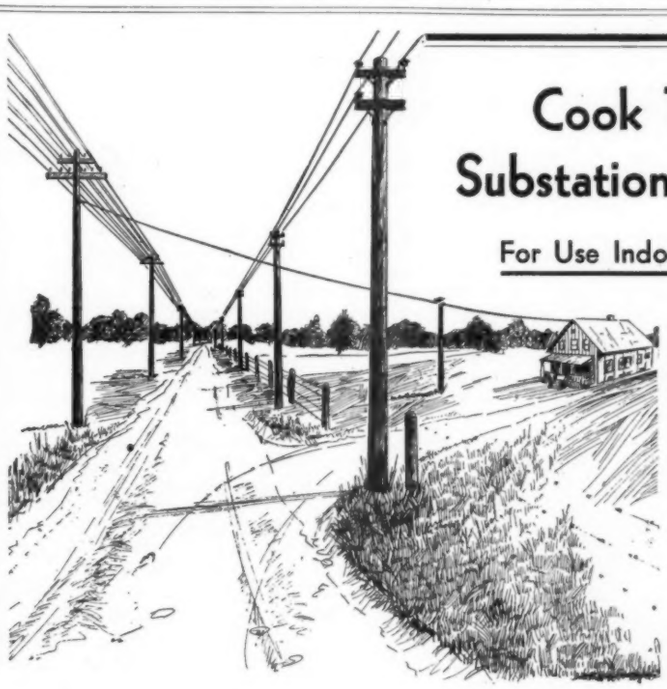
Financial.

DOVER, DEL.—The Southwestern Associated Telephone Co. has filed a notice for permission to increase its capital stock from 20,000 to 90,000 shares.

Construction.

WILMINGTON, CALIF.—More than 55 per cent of the work has been completed on the installation of eight miles of telephone cable throughout the Wilmington ex-





Cook Type O Substation Protection

For Use Indoors or Outdoors

- Porcelain Base and Back
- Galvanized Bracket
- Zinc Hood
- Bronze Fuse Clips
- Carbons and Dielectrics

or

- True Gap Dischargers
- Four Different Lengths of Fuses

Line and Instrument Wire Connected on Opposite Sides of Porcelain.

THIS IS A SMALL, NEAT, COMPACT PROTECTOR, OF STURDY CONSTRUCTION, HIGH QUALITY, AT AN UNUSUALLY LOW PRICE.

COOK ELECTRIC COMPANY

2700 Southport Ave. » « « « CHICAGO

change. According to Charles L. Tuttle, manager of the Southern California Telephone Co., it is estimated that nearly $41,000 will be expended on the project, necessary to care for growth due to the development of the harbor and increasing activity along the waterfront.

During the last ten years the Wilmington exchange has grown from approximately 400 telephones to the present 2,560 telephones.

Construction.

CHARLESTON, ILL.—Plans for the erection of a new building here this summer are being made by the Illinois Southeastern Telephone Co.

FULTON, IND.—The Northern Indiana Telephone Co. is making extensive improvements to its lines out of the Fulton exchange. Many old lines are being replaced.

SHELBY, MONT.—Approximately $160,000 will be expended by the Mountain States Telephone & Telegraph Co. for construction work to be done in Shelby and in lines connected with Shelby this year, according to an announcement by Tom Crayon, manager of the local exchange.

There will be about 85 miles of new line constructed between here and Havre. In addition to this about $33,000 will be used on a new line between Shelby and Cut Bank which is being built to better the service to Glacier Park.

A total of $800,000 will be expended during 1931 by the Mountain States company for the improvement and extension of telephone service in Montana, according to information received from President F. H. Reid.

Of the total expenditure for new telephone construction about $250,000 will be for improvements and extensions to long distance facilities.

The principal long distance projects in Montana include a phantom circuit group and other miscellaneous work on the Havre-Shelby line; copper group and 24 miles of new pole line between Shelby and Cut Bank; a copper circuit between Missoula and Polson, and re-routing of toll lines on account of highway changes.

HARTINGTON, NEB.—To accommodate Hartington farmers another telephone farm line is being erected north of this city by the Cedar County Farmers Telephone Co. With the addition of this new line, there will be 27 farm lines from the office.

KINGFISHER, OKLA.—The telephone system of the Western Telephone Corp. is being rebuilt. The work includes laying of 3,000 feet of underground cable and placing of a number of poles.

TISHOMINGO, OKLA.—It is reported that a new brick telephone exchange building is to be constructed here by the Southwestern Bell Telephone Co.

WETUMKA, OKLA.—A new common battery exchange system is being installed here by the Southwest Telephone Co.

LENNOX, S. D.—After having been in progress several weeks, improvements to the telephone system of the Central West Public Service Co. have been completed. According to W. C. Martin, manager of the company here, the improvements cost approximately $15,000.

The entire system was rebuilt and old poles and wires taken down. Ten miles of new open wire were strung, 211 subscriber stations wired and protectors installed.

EL PASO, TEXAS.—A total of $925,000 will be expended during 1931 by the Mountain States Telephone & Telegraph Co. for the improvement and extension of the telephone service in New Mexico and in El Paso County, Texas, according to information received from President F. H. Reid by Frank E. Farwell, El Paso-New Mexico manager.

Of the total expenditure for new telephone construction about $225,000 will be for improvements and extensions to long distance facilities.

The principal long distance projects in New Mexico and El Paso county include copper long distance facilities between Clovis and Fort Sumner and between Fort Sumner and Santa Rosa, new circuit between El Paso and Las Cruces and other miscellaneous work; toll entrance cables in El Paso; copper circuit between Roswell and Artesia toll entrance cable in Las Cruces; toll entrance cable in Las Vegas and rerouting toll lines because of highway changes.

OGDEN, UTAH.—A total of $875,000 will be expended during 1931 by the Mountain States Telephone & Telegraph Co. for the improvement and extension of telephone service in Utah, according to information received from President F. H. Reid by Angus Smedley, local manager.

Approximately $60,000 will be expended in Utah in connection with the rerouting of toll lines made necessary by highway changes.

LYNCHBURG, VA.—Twenty-six miles of telephone lines are to be added this spring to the system in use in the Natural Bridge national forests. This will bring the system up to 179 miles. Buena Vista will probably be the central point for the system. Several hundred dollars' worth of damage was done to the system in the northern part of the forests by sleet recently.

EAU CLAIRE, WIS.—The Wisconsin Telephone Co. plans to erect a new $825,000 exchange building here this year.

LAKE GENEVA, WIS.—W. R. Whiting, manager, Wisconsin Telephone Co., has announced that plans for additions, extensions and betterments to the telephone plant here this year provide for expenditures of $16,000. More than $10,000,000 will be expended for construction purposes throughout the state.

The work in connection with the installation of subscribers' stations will require an expenditure of $7,000. About $5,000 will be spent for additions to the telephone outside plant. Additional central office equipment to provide for exchange and long distance requirements will necessitate an expenditure of $4,000.

The Lake Geneva exchange now provides service to approximately 1,920 subscribers.

Elections.

CLEVELAND, IND. (P. O. Charlottesville) At the 27th annual meeting of the Cleveland Telephone Co. the officers elected for the ensuing year are as follows: President, Walter D. Addison; vice-president, J. Chester Lowes; secretary, Rev. C. E. Ellsworth; treasurer, Mrs. Alta Williams.

INDIANAPOLIS, IND.—At the annual meeting of the stockholders of the Indiana Bell Telephone Co. the following directors were reelected: James F. Carroll, Indianapolis; Charles P. Cooper, New York; Fred C. Gardner, Indianapolis; Walter S. Gifford, New York; William G. Irwin, Columbus, Ind.; Frank A. Montrose, Indianapolis; Curtis H. Rottger, Frank D. Stalnaker, and Elmer W. Sout, all of Indianapolis.

After the meeting of the stockholders the directors reelected the following officers: J. F. Carroll, president; F. A. Montrose, vice-president and general manager; R. C. Rottger, vice-president; A. R. Henry, secretary and treasurer, and W. J. McWilliams, general auditor.

NEWARK, OHIO.—At the annual meeting of the Newark Telephone Co. stockholders selected the following officers and directors: W. L. Cary, Columbus, president; C. H. Spencer, vice-president; T. J. Evans, secretary; W. C. Metz, treasurer; H. H. Postle, W. C. Newton, of Columbus, and Dwight M. Warner, of Utica, members of the board of directors.

Miscellaneous.

DECATUR, ILL.—The branch accounting office of the Illinois Commercial Telephone Co. has been moved from Decatur to Murphysboro. H. H. Jebens will be in charge of revenue accounting of all the company's exchanges in Illinois.

JACKSONVILLE, ILL.—Warren Kamm has been named manager of the Bluffs exchange of the Illinois Telephone Co.

NEW RICHMOND, IND.—William McCrea of this place has purchased the Citizens' New Telephone Co. which has exchanges at Ellettsville, Clear Creek and Smithville.

These properties belonged to Frank E. Matthews, of Bloomington, and James H. Matson, of Ellettsville. The transfer was made April 1 and is now under the management of Mr. McCrea.

BERTHA, MINN.—The Bertha Telephone Co., owned and operated by Mrs. Myrtle Bluhm, has been sold to Joseph Steinhagen, of Waconia, for $8,000, it has been announced.

GOLDSBORO, N. C.—H. Braxton Weaver has been promoted from the position of office manager of the Southern Bell Telephone & Telegraph Co., in Greensboro, to that of district manager of this office to succeed George W. Taylor.

WESTON, W. VA.—Purchase of the Lewis-Upshur and the Harrison-Doddridge telephone plants by J. Roy Watson and A. G. Hudkins, both of Weston, from the Central West Virginia Utilities Co., was announced recently.

The amount of money involved in the transaction was not divulged. Lines of the plants extend into Gilmer and Taylor counties as well as in the four counties named.

Report of Telephone System in Helsingfors, Finland.

The local calls handled during 1930 by Helsingfors Telefonforening (the telephone association of Helsingfors, Finland), amounted to 60,045,730 as compared with 56,151,602 in 1929 and 51,931,158 in 1928. The greatest number of calls per day occurred on May 30, with 233,905, and the least on June 24 with 24,513 calls. Direct lines at the end of the year totaled 24,884 or 1,528 more than the previous year.

About one-third of the country's telephone apparatus is of the German Siemens & Halske make. L. M. Ericsson has some lines near Helsingfors. The association's statement showed assets of 45,806,964.24 Fmks. (one Finnish mark equals $0.0252) and liabilities of Fmks 19,019,268.38 with a surplus of 776,249.87 Fmks., of which has been credited to the reserve fund.

There is a movement on foot to bring all the telephone lines into one organization, having the controlling interest in the hands of the Finnish government but operating it as a private enterprise. Siemens & Haske, the L. M. Ericsson Co. and an American firm have bid for concessions to operate the country's telephone lines, but as yet nothing has been decided.

WHAT THE COURTS AND COMMISSIONS ARE DOING.

(*Continued from page 32.*)

some time to obtain a final decision in the matter, inasmuch as the Radio corporation would undoubtedly ask for a restraining order against the commission should it refuse to renew the corporation's licenses.

Summary of Commission Rulings and Schedule of Hearings.

ARKANSAS.

April 24: Hearing on application filed by 25 residents of New Edinburg, Cleveland county, asking that the New Edinburg Telephone Co. be required to furnish adequate service to the community by enlargement and extensions of its lines.

CALIFORNIA.

April 28: G. W. Bandy authorized to sell telephone properties serving the communities of Kernville, Isabella, Weldon and Onyx in Kern county; White River, Glenville, Jack Ranch, Woody, Cota Ranch, A. S. Kinkle's Grove, and Hill Brothers Grove in Tulare county, to J. A. Green. The latter is authorized to issue a note in the sum of $3,800 in part payment of the purchase price of $5,000.

April 28: San Fernando Telephone & Telegraph Co. authorized to place in effect on June 1, a charge of 25 cents per month for the use of handset telephones in addition to the regular charge for deskset telephone service.

ILLINOIS.

May 6: Hearing in Springfield before Commissioner Gilbert on proposed advance in rates for service in Homer, county of Champaign, stated in rate schedule I. C. C. No. 2 rendered by the Illinois Commercial Telephone Co.

May 6: Hearing in Springfield before Commissioner Collins on proposed advance in rates for service in Bethany, county of Moultrie, stated in rate schedule I. C. C. No. 2 of the Illinois Commercial Telephone Co.

May 6: Hearing in Springfield before Commissioner Wilson on proposed advance in rates for service in Hudson, county of McLean, stated in rate schedule I. C. C. No. 2 rendered by the Illinois Commercial Telephone Co.

INDIANA.

April 28: The Northern Indiana Telephone Co. given permission to issue $333,500 in 6 per cent notes.

April 28: Order issued approving the purchase of the New Ross Co-operative Telephone Co. by the recently organized New Ross Co-operative Telephone Corp. and granting the latter company permission to issue 175 shares of common stock at $40 a share.

April 28: Permission given the Max Telephone Co. to file with the commission its new rate schedule of $2.50 a quarter. The present rate is the same and the action constitutes the commission's recognition of the schedule.

May 8: Oral arguments were heard for rehearing on a petition of the Indiana Commercial Telephone Corp. to absorb the Home Telephone Co., of Elkhart, and other properties.

The commission denied the merger in an order March 21. On April 15, the Home Telephone Co. filed the petition for a rehearing, and set out, among other things, that the $129,000 it had loaned were not from its earnings, but from a stock and bond issue that the commission had authorized in order to make possible extensions and improvements.

Commissioner Frank T. Singleton, who wrote the order, had held that, inasmuch as the company had been able to lend that amount, the commission should make an examination to determine whether the rates to customers should not be reduced. The petition for rehearing took exception to that interpretation of the company's financial position.

KENTUCKY.

May 13: Hearing on complaint of Mayor B. M. Goodpaster, of Owingsville, E. H. Goodpaster, and J. A. Richards, protesting against the rates charged subscribers in Bath county by the Kentucky State Telephone Co.

Delegations of eight other counties of the central and northern part of the state recently appeared before the commission protesting against the rates. The delegation was told by the commission that they should file a brief, setting out the rates charged in the various counties.

MICHIGAN.

May 1: Hearing on petition of citizens of Lee township, Allegan county, declaring that the Tri-County Telephone Co. is infringing on the service rights of the Pullman Mutual Telephone Co. and requesting the commission to grant the Pullman company sole right of operation.

MISSOURI.

April 22: Application filed by C. W. Brooner for permit of public convenience and necessity to construct, maintain and operate a telephone system or exchange in the town of Stela.

April 22: Remonstrance filed by citizens of Pleasant Green against petition of the United Telephone Co. asking permission to

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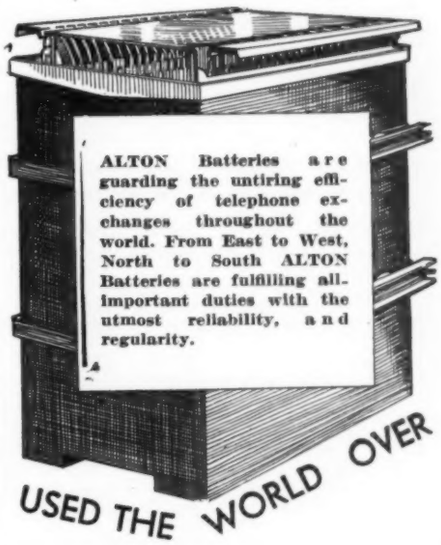
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discontinue the exchange at Pleasant Green. The United company recently purchased the exchange and asked the commission for authority to abandon it.

It is declared in the petition of Pleasant Green citizens against such authority being granted; that the United company made a thorough investigation before buying, and that the exchange is earning as much now as when the company took it over. It also expresses the belief that it can be made a paying investment without any increase in rates.

April 23: Application filed by the Farmers Telephone Co. of Sullivan county for an order authorizing issue of stock.

NORTH DAKOTA.

April 6: Approval granted application of the Brisbane-Lark Farmers Telephone Co., of Raleigh, for authority to build certain telephone lines.

April 6: Application of the Farmers Telephone Co., of Cando, for authority to dismantle certain telephone lines in Towner county, granted.

April 6: Approval granted the joint application of the Farmers Mutual Telephone Co. and the Farmers North Line Co. to sell and buy, respectively, certain telephone lines located in Mountrail county, in the vicinity of Lunds Valley.

April 24: Approval given sheet No. 1 of section 10 of general rates and charges covering regulations and changes for inside moves and changes in type of equipment, filed by the Dakota Central Telephone Co.

April 24: Second revised local exchange tariff, filed by the Northwestern Bell Telephone Co., providing a rate for metallic rural service applicable to Hettinger, approved.

April 24: Approval granted the joint application of the Northwestern Bell Telephone Co. to sell and the Windsor Telephone Co. to buy telephone property located in Windsor.

April 24: Approval granted the joint application of the Farmers Mutual Telephone Co., of Lunds Valley, and the Farmers Mutual Telephone Co., of White Earth, to sell and buy, respectively, line No. 5, located in Lunds Valley.

OHIO.

June 23: Hearing in suspended rate case of the Ohio Cities Telephone Co. relative to service at New Philadelphia and Dover. The hearing was postponed from May 26 at the request of counsel for the company, who stated they are engaged in other matters pending before the commission, and wish more time to prepare arguments.

OKLAHOMA.

April 22: Order issued in case of Oklahoma-Arkansas Telephone Co. vs. Southwestern Bell Telephone Co. involving dispute over toll settlements. The Southwestern Bell Telephone Co. ordered to remove its toll switchboard in Poteau insofar as it affects intrastate service and restore such service between its toll lines and exchanges of the Oklahoma-Arkansas company as existed prior to January 22, 1928. The basis of settlement for compensation to the Oklahoma-Arkansas company for its toll business is set forth in order and latter company is required to file a bond of $2,500 to guarantee its compliance with the order.

WISCONSIN.

May 12: Continued hearing on proposed increase in telephone rates in Madison by the Wisconsin Telephone Co.

Several months ago the first hearing was held. To fight the proposed increase, it is reported that the city council appropriated $6,000.

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